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ANNUAL ADDRESS OF JAMES FLETCHER, PRESIDENT OF THE ENTOMOLOGICAL CLUB OF THE A. A. A. S. 1889.\*

GENTLEMEN :—Another year has rolled by since we held our last pleasant meeting in the city of Cleveland. It is with much pleasure that I recognize here to-day the faces of several of those who helped to make that meeting so successful, and, as gratitude has been satirically described as “a keen appreciation of further favors to come,” I feel grateful to such of you for being present at this meeting, the success of which, to a certain extent, your presence assures, but for which I, as presiding officer, shall be held largely responsible. With the help of our Secretary I have endeavored to arrange the papers to be read, so as to save as much time as possible, and at the same time to make the most of the papers. It is a time-honored custom that the President should give an address at the opening of the Annual Session, I therefore bow to the decree of fate, and shall endeavor for a short time to lay before you some subjects which it has occurred to me are worthy of consideration by the members of the Club. Inaugural addresses generally take the form either of a prospective or retrospective view of the matters with which the Society, before which they are delivered, particularly concerns itself, or on the other hand, they are devoted to the elaboration of some one special subject. I purpose following the former of these courses to-day, and shall briefly remind you of

\* See Ento. Amer. v, p. 201.

some of the most remarkable occurrences affecting entomologists, which have taken place during the period that has elapsed since we last met, and I shall also endeavor to direct your attention to one special matter connected with the future of the science, which, it seems to me, can be discussed to advantage during the present meeting.

When last year you conferred upon me, what I felt was the too great honor of electing me, the first Canadian, to fill the chair of the Entomological Club, I accepted that position as tendered to the President of the Entomological Society of Ontario in recognition of the good work that has been done by that Society, which I, on that occasion, together with Dr. Bethune, had the honor of representing as delegate.

The chief attacks by insects upon cultivated crops which have demanded the attention of entomologists during the past season, are the following: In all parts of Canada and the United States the noctuid larvæ known under the name of "Cutworms," were extremely abundant in the spring. In the maritime provinces of New Brunswick and Nova Scotia, as well as Quebec, the Tent Caterpillars did much injury to orchard and forest trees. In central Ontario *Meromyza americana* was unusually abundant, but it was also accompanied by its parasite, *Cœlinius meromyzæ*. Not only were certain kinds of wheat and barley severely attacked, but also a single instance of the attack on oats was observed, and I made the further unpleasant discovery that the species bred freely in various wild grasses, chiefly of the genera *Agropyrum*, *Deschampsia*, *Elymus* and *Poa*. Upon the experimental grass patches of the Experimental Farm at Ottawa, the species of *Agropyrum* and *Elymus*, and *Poa serotina* were the grasses most attacked, while only a single instance of injury to *Setaria viridis* was noticed. An interesting point was, that while *Poa serotina* was so severely injured, *Poa pratensis*, *Poa cæsia* and *Poa compressa* were almost exempt. The species of *Elymus* and *Deschampsia* were attacked in the young shoots close to the root, but the others mentioned in the top joint of the flowering stems, by which the appearance known as "Silvertop" was produced. The name "Silvertop" is also applied to the results of the ravages of *Phlæothrips poaphagus*, which is now becoming a "first-class pest" in many parts of Canada. The grasses which suffer most from this insect are, early in June, *Poa pratensis*, and later in the month, *Phleum pratense*. A much more serious matter, however, was a new injury to oats by a species of *Thrips*, which has

been found to be undescribed. This insect attacks the flowers of oats just before they leave the sheath, in consequence of which they turn white and die.

An outbreak which may prove to be one of great importance is the appearance, during the past summer, in one of our Canadian towns, of large numbers of the European flour moth (*Ephestia kuhniella*). Radical measures have, however, been taken by the provincial government for its suppression, and I trust that it may be stamped out before it spreads to other centres of the milling industry.

In the United States the attacks of most interest were the following: The appearance, in very large numbers, of *Siphonophora avenæ* in Michigan, Ohio, Indiana and Illinois, drew forth many notices in the public press. Perhaps next in importance was the outbreak of an imported fly of the genus *Hæmotobia*, which has increased so as to become a serious pest to cattle. It has occurred in injurious numbers in Pennsylvania, New Jersey, Delaware, Maryland and Virginia. Its life history has been studied by the entomologists of Washington, and Prof. J. B. Smith, in New Jersey. The salient points are already discovered, and successful remedies have been made known. The Army Worm (*L. unipuncta*) has done restricted damage in Indiana, and has also occurred in Florida. Brood VIII of *Cicada septendecim* has appeared in Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Kentucky, Maryland, north Virginia and North Carolina. The Chinchbug (*Blissus leucopterus*) has been abundant in Missouri during the past summer, and the Hop Aphis (*Phorodon humuli*) is reported as more abundant in New York this summer than it has been since 1886. *Attacus cecropia* has been remarkably abundant in the tree planted regions of the West and Northwestern States.

The Cotton Worm and Boll Worm have been very abundant and injurious in the cotton-fields of the South. Trees and shrubs of all kinds, both in the United States and Canada, have suffered much by the attacks of various leaf-hoppers. These attacks will doubtless all be dealt with by the United States entomologist, or the State entomologists in their reports, so I shall not now speak of them at greater length than I have done, but will beg you to give me your special attention while I speak to you upon a subject which appears to me to be, at the present time, one of very great importance. It has lately been brought prominently before the entomological world in the pages of "Insect Life." This is no less than the organization of the active, working, economic entomologists of North America into a permanent association or union, so that an

opportunity may be afforded to those students who are specially engaged in the practical application of the science of meeting periodically to discuss new discoveries and to exchange experiences as to the best methods of work. The value of such an association cannot, I believe, be overestimated. The recognition which, during the past decade, has been accorded to Entomology as a branch of Practical Agriculture, makes it important that as little time as possible should be wasted upon unnecessary reduplication of experiments, and also on the other hand that successful methods of combating injurious insects should be made known as widely and quickly as possible.

A small number of the States of the Union had employed their State entomologists for some years past, and Canada her's since 1884. All of these officers had striven hard to do good and useful work in the vast field which lay before them. Recently, however, a great impulse has been given to practical science in all lines by the very important "Hatch Experiment Station Act," which was passed by Congress in 1888. This Act provides that a sum of \$15,000 should be annually set aside for the purpose of carrying on scientific agricultural experiments in every State of the Union. In consequence of this Act there have already been organized Experimental Stations, twenty-seven of which have entomologists on their staffs, and these officers have already issued much valuable practical information in the shape of bulletins to the farmers of their respective States. The operation of injurious insects are such an important factor in the success or failure of all crops grown, and the recognition of that fact is now becoming so wide-spread amongst the educated agricultural classes, that before long it is beyond question that the directors of the other Stations will see the advisability of adding an entomologist to their staff. The result of this will be that we shall have in North America a large number of men specially trained for the work they have undertaken, with sufficient time and means at their disposal for carrying out any experiments which may be necessary. Surely, under such circumstances important results must follow. They all have the same object in view—the discovery, as soon as possible, of practical—that is, efficient, simple and cheap—remedies for the various injurious insects which destroy produce. The work of all these students will, of course, have to be carried on independently, in widely separated localities, and a fact which will give special value to their labors will be, that similar experiments will be carried out carefully and scientifically under differing circumstances and with varying climatic conditions.

Such an opportunity for showing the value of Science has never before occurred, and it is incumbent upon the men who accept these positions to recognize also the responsibility of their offices. I would suggest that not only is extreme care necessary in the carrying out of our experiments as official entomologists, but also great thought must be given to the best means of publishing and making known results. Above all things is it necessary to gain the confidence of those for whom we write. The editors of agricultural papers are frequently enquiring for articles upon Economic Entomology, but they always say they *must* be simply expressed, or they are useless to them because their readers will not read them. Even amongst highly educated, and even cultivated people, you find many to whom the very word "science" is a bug-bear, and much more is this the case with the large class of agriculturists. A class which, although it does contain many men of education and culture, of course consists mainly of men who have not had the time nor opportunity to avail themselves of educational advantages. They are, however, as a class, men who spend their lives away from the distractions, largely frivolous, of city life, and, as a consequence, develop a faculty for observation, thought and practical application, which would indeed be a boon to many an aspirant to scientific fame. Writings upon agricultural entomology should be, I think, couched in the simplest language possible; the articles should be short and concise, without too much detail of the life-history of the insects discussed. Prominence should be given to the nature of the attack, so that it may be recognized; the essential points of the life-history of the insect, so that its habits may be understood and missing links filled in; and above all the best remedy, under existing local circumstance; and lastly a statement of such information with regard to the pest as may be lacking.

During a somewhat extensive intercourse with farmers I have always found them anxious to learn anything about injurious insects and the means of combating them. As a general thing they are willing to devote both time and labor to any experiments suggested if there is only a chance of success, but they complain that frequently writings which are professedly written expressly for them are unintelligible, that there is too much detail concerning the life-history, or that even under remedies there is frequently a long string given without comment, some of which are good and some useless. Now this is, to a certain extent, true, and is due, I think, to two causes—either, as stated in "Insect Life," that "Economic Entomology has heretofore greatly suffered by the writings and pretensions of

those who have no sort of appreciation of its real value and importance, but who, writing at second-hand upon subjects of which they have no personal knowledge whatever, are just as apt to disseminate error as truth," or perhaps to the fact that some entomologists have tried to cover too much ground, and while professedly writing articles for the good of a class which it is assumed has no knowledge of scientific terms; at the same time they endeavor to maintain their scientific status and secure the credit of priority in description or discovery. I would venture the opinion that it is impossible to combine these two causes advantageously, and that the scientific details and necessary descriptions and discussion of theories would find a more appropriate place in the scientific periodicals and transactions of societies devoted to the subject, whilst the results, the practical application of our work for the good of the country should be published where, and in the manner, it can do most good. It will be seen in this way that I give the highest place of honor to Economic Entomology, and this I really believe to be a proper arrangement. The systematic classification of orders and genera, and the arrangement of large collections so as to understand the proper relationships which exist, are matters of engrossing interest, but the intelligent application of this knowledge for the benefit of mankind at large, draws such vast consequences in its wake that it demands the closest attention of entomologists. So great, however, is the field of Entomology that it cannot possibly be covered by any one individual, and the work of specialists in every department is necessary. Owing to the institution of the various Experiment Stations in the United States with their several entomologists, doubtless the attention of many will now be turned to Entomology who otherwise would not have thought of it, and also so many men entering enthusiastically upon the field at the same time to do original work will certainly have the effect before long of producing eminent and useful public officers. I therefore make a special appeal to you to consider now whether a union which would be the means of bringing together at least once a year all those working specially in Economic Entomology would not be a useful institution. Some of the official entomologists have been well trained in Economic Entomology, whilst others are young men fresh from college, and with only a general knowledge of the subject. To these latter, of course, by far the greatest advantage would accrue; there is such an infinity of small things and so many doubts, which a word from one of greater experience can settle, that the meeting once a year where questions of economic interest alone would be discussed,

would be, I believe, an inestimable boon to all of us. And from the favor with which this suggestion has been received by many of the fathers of Economic Entomology, I believe that even they would reap sufficient benefit from the experience of others to well repay them for any time they might devote these meetings for the encouragement of others and for the good of the cause. Without going into too great detail I will mention one or two of the advantages which have occurred to me in connection with such an organization. First of all it will give opportunities for a large body of earnest workers in the same field and with the same interests, to become acquainted with each other, and this I consider a point of great importance. I regret to say that it cannot be denied that there is sometimes evidence of unkindly feeling towards fellow students in scientific writing. The social intercourse which would be engendered by the union would do much to put an end to this. Many small matters which might offend or hurt, can be overlooked, or as we say, "understood" when we know the man from whom they emanate, and I presume my experience of life cannot have been very widely different from that of other people when I have found far more to like than to dislike in everyone when you come to know them. Well, this union will allow us to know each other. It will give us an opportunity for systematic work. Problems frequently arise of paramount importance. By this means it will be possible to delegate certain parts of any special investigation to such students as may have special opportunities therefor.

Above all, the union will be an advisory board either for discussing matters of great interest to ourselves or for the advice of the legislature upon occasion of any serious invasion or threatened visitation by insect enemies; thus while we are united we shall do far better scientific work; we shall uphold better the dignity of our offices; we shall gain the confidence of the public, and of the government, and we shall be bound together in a solid union for our own good and that of the country at large.

Although I have taken the liberty of bringing this matter before you now, and ask you to express an opinion upon it at once, as you are all aware it is no new idea sprung upon the meeting unawares. As I have mentioned, notices have appeared in "Insect Life" suggesting the matter, and I have myself distributed, to every one who I thought would be interested, a circular notifying them that I proposed bringing the matter up for discussion.

The movement seems to have originated with the very eminent United States Entomologist, Prof. C. V. Riley, who has done so

much by his writings and successful experiments to raise Economic Entomology to the honorable position it now enjoys in the appreciation of intelligent people of all classes.

And now gentlemen allow me to thank you for the great honor you conferred upon me when you elected me to preside over you during the past year and at this meeting. I hope, sincerely, that the Entomological Club of the American Association may continue to prosper and be the means of bringing us all together at least once a year, like the members of a large and attached, but widely scattered family who rejoice when, on such festivals as Christmas, New Year, or Thanksgiving Days, an excuse or opportunity is given for a social reunion, where we may discuss with each other in a friendly manner matters of general interest. I trust that during the present meeting the deliberations may be carried on in the same spirit of kindness and forbearance which have always characterized previous meetings, and in conclusion I hope that we all may long be spared to meet annually and derive from each other the benefits of scientific discussion and enjoy the social pleasures of mutual intercourse.

JAMES FLETCHER.

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## LARVÆ OF SEIRARCTIA ECHO.

BY ANNIE TRUMBULL SLOSSON.

I have received the following very interesting letter from Mr. A. J. Brink, of Ormond, Fla. Mr. Brink is an intelligent and reliable observer, and what he writes seems to confirm the statements made to me by many persons concerning the larvæ of *S. echo* and their habit of invariably travelling in a northerly direction :

“During the last week in April I saw quite a novel sight. I was driving on the beach with a friend when, about six miles from Ormond, we saw in the distance a dark line drawn from the bluff to the water's edge. Beyond it, as far as the eye could distinguish, the beach was covered with some dark substance. Upon approaching it we discovered that the sand was literally alive with the larvæ of the Echo moth. What seemed to us very peculiar was the well-defined line running at right angles to the bluff and reaching to the water. Between us and that line not a caterpillar was to be seen, while beyond it were countless thousands hurrying along in the same direction toward some unknown destination. The beach at this point is about three hundred feet wide, and for more than two miles we drove through them. I know I do not exaggerate when I say

that there were at least six caterpillars in every square foot for the entire distance. Leaving my team I climbed the ridge to learn, if possible, why they were thus congregating on a spot so entirely devoid of vegetation. I saw at once that their well known habit of travelling in a northerly direction was getting them into trouble. The beach at this point bears considerably west of north, and the caterpillars on reaching the edge of the bluff would roll down to the beach, from whence it was impossible to return. Even here they turned neither to the right or left, but persistently crawled on to the water's edge, where each receding wave would carry out dozens, only to bring them back dead and pile them up in ridges on the beach. In places these ridges of dead caterpillars would be fully four inches high. After driving two miles or more we found the beach suddenly clear of them, the line here being as well defined as on the south side, where we first approached them. While watching them I went inland seventy-five feet or more into the palmetto scrub. Here they were not nearly as thick, but there were a great many on the ground, and all travelling in the same direction."

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## SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 44, vol. iii)

### AGALLISSINI.

The characters of this tribe are stated in Bull. Br. Ent. Soc. vii, p. 114, and are fully discussed in the "Classification" p. 306. It contains only two species, both very rare in collections, viz. :

**Agallissus gratus** Lec.

Length 19 mm. = .75 inches. *Habitat.*—Texas.

Shining black, sparsely punctured, with the elytra narrowed behind, truncate and finely serrate at tip, ornamented with yellow spots, of which the basal pair are elongate. Front quadrate, oblique; prothorax rounded on the sides; sutural spine of elytra moderately prominent. Antennæ slender, shorter than the body in both sexes.

**Zagymnus clerinus** Lec., S. M. C. No. 264, p. 203.

Length 13 mm. = .52 inches. *Habitat.*—Florida.

Opaque black, very coarsely and deeply punctured with the elytra parallel on the sides, rounded at tip, with a round basal spot

and two broad transverse scarlet bands, interrupted at suture and connected at margin; sutural spine small. Front short, vertical; prothorax longer than wide. Antennæ like preceding. A specimen in the collection of Mr. Ulke is entirely black.

ATIMIINI.

**Atimia confusa** Say, J. A. P. v, 2, 1827, p. 276; Hald., Proc. Ac. Phil. iv, p. 373; Lec., J. A. P. ser. 2, ii, 1850, p. 25; *tristis* Hald., Trans. Am. Phil. x, p. 56.

Length 10 mm. = .40 inches. *Habitat.*—Texas.

**A. dorsalis** Lec., Ann. Nat. Hist. iv, 1869, p. 385.

Length 10 mm. = .40 inches. *Habitat.*—Vancouver, So. Cala.

Both are short, stout insects, resembling a rather stout Lamiine. The body is densely clothed with long, coarse, luteous hair, with some denuded spots on the thorax and elytra; the former is quadrate transverse, scarcely rounded on the sides and coarsely punctured; the latter a little broader, truncate at tip, more faintly and very sparsely punctured, with several rows of very distant larger punctures. “*A. dorsalis* is closely related to *R. confusa*, but differs by “the prothorax being less transverse, almost quadrate and scarcely “rounded at sides, except near apex, where it is suddenly narrowed. “The arrangement of the denuded spots is somewhat similar, but “the sides of the thoracic vitta are straight and the elytral spots are “confluent, forming a vitta extending nearly to the tip with two ex- “ternal dilations” (Lec. l. c.)

LEPTUROIDES.

The fourth and last division of the Cerambycinae is characterized and divided as follows :

Base of antennæ not enveloped by the eyes, which are entire or emarginate, and usually finely granulate; front coxæ conical (except in *Distenia*); stridulating plate of mesonotum divided by a smooth space or furrow.

- Mandibles scalpriform, not fringed . . . . . **Disteniini.**
- Mandibles simple, not fringed . . . . . **Desmocerini.**
- Mandibles acute, fringed on the inner margin.
- Elytra abbreviated . . . . . **Necydalini.**
- Elytra not abbreviated.
- Front nearly vertical . . . . . **Encyclopinini.**
- Front oblique, or horizontal . . . . . **Lepturini.**

DISTENIINI.

**Distenia undata** Oliv., Ent. iv, 69, p. 25, t. 2, fig. 15; Buquet, Mag. Zool. 1843, t. 118, fig. 7; Lec., J. A. P. ser. 2, ii, 1850, p. 37; Lacord., Gen. Atl. x, t. 95, fig. 1.

Length 17—25 mm. = .70—1.00 inches. *Habitat.*—Eastern U. S.

Very elongate, brown, clothed with dense gray pubescence; head large, horizontal; antennæ about as long as the body; mandibles thick, curved, chisel shaped at tip, apical edge vertical, sharp, straight; prothorax with dorsal elevations and acute lateral spine; elytra gradually narrowed, bispinose at tip, bearing two distinct discal costæ and a sutural and marginal costa fainter; punctures between large and distinct. The elytral pubescence is partly denuded, leaving a basal blotch and two angulate bands brown.

DESMOCERINI.

Four species of *Desmocerus* form this tribe, and the following synopsis has been published by Dr. Horn, Trans. Am. Ent. Soc. ix, 1881.

Elytra with basal half yellow, apex blue, disc faintly tricostate . . . **palliatus**.  
Elytra either entirely yellow, or margined with yellow, not costate.

Male elytra orange-yellow, female with discal blue space; punctuation moderately coarse, a little finer near apex . . . . . **auripennis**.

Elytra similarly colored in the sexes, both narrowly margined with yellow at sides and base.

Thorax irregularly plicate; elytra coarsely and deeply punctured from base to apex . . . . . **cribripennis**.

Thorax densely punctured, regularly convex; elytra moderately coarsely punctured at base, more finely and densely at apex . . . **californicus**.

**D. palliatus** Forst., Nov. Spec. Ins. 1771, p. 40; Lec., J. A. P. ser. 2, i, p. 318; Harris, Ins. Mass. p. 92; *blandus* Fab., Syst. Ent. p. 182; *cyaneus* Fab., Syst. Ent. App. 1775, p. 823; *elongatus* Bland., Proc. Ent. Soc. Phil. i, 1862, p. 269.

Length 17—23 mm. = .70—.90 inches. *Hab.*—La., N. C., N. Y. Ct, Va. Pa.

**D. auripennis** Chev., Rev. Zool. 1855, p. 187; Ann. Fr. 1858, p. 325, t. 8, f. 6. Length 22 mm. = .88 inches; ♂ ♀. *Habitat.*—Cala., Nev.

**D. cribripennis** Horn, Trans., Am. Ent. Soc. ix, 1881, p. 7.

Length 16 mm. ♂, 20 mm. ♀ = .64—.80 inches. *Hab.*—So. Cala., Wash.

**D. californicus** Horn, l. c.

Length 12 mm. ♂, 18 mm. ♀ = .48—.92 inches. *Habitat.*—California.

NECYDALINI.

This tribe contains four species in two genera, all of considerable size and conspicuous among the Longhorns by the abbreviated elytra, which are scarcely longer than the thorax, dehiscent and separately rounded at tip. They may be separated as follows:

- Last joint of palpi oval ; third and fourth antennal joints together not longer than the fifth . . . . . **Ulochætes leoninus.**  
Last joint of palpi bell shaped ; third and fourth antennal joints together distinctly longer than fifth . . . . . **Necydalis.**  
Elytra obliquely impressed only . . . . . **N. mellitus.**  
Elytra obliquely impressed and also transversely near tip.  
Antennæ more slender, fourth joint longer . . . . . **N. lævicollis.**  
Antennæ stouter, fourth joint shorter . . . . . **N. cavipennis.**  
The fourth antennal joint in *cavipennis* ♂ is scarcely more than half as long as the third. In the ♀ it is not so conspicuously short, but still much shorter than in *lævicollis*.

**U. leoninus** Lec., Proc. Ac. Phil. vii, p. 82 ; Ent. Rept. 1857, p. 62, t. 2, f. 12.  
Length 25 mm. = 1.00 inches. *Habitat.*—Oregon, Nevada.

The short elytra and great size will quickly distinguish this remarkable species. It is very robust and hairy, and seems to be rare in collections.

**N. mellitus** Say, Bost. Journ. i, 1835, p. 194; *americana* ♀ Hald., Trans. Am. Phil. x, p. 44 ; Proc. Ac. Phil. iv, p. 372.  
Length 15—21 mm. = .60—84 inches. *Hab.*—Ind., Pa.

Color variable, usually rufotestaceous, head, antennæ (base and tip tinged with rufous), thorax, scutellum and abdomen above black ; elytra punctate, more coarsely towards the margin ; reddish brown with paler spot at tip, or entirely rufotestaceous. The oblique impression is not deep, and does not reach the tip.

**N. lævicollis** Lec., Ann. Nat. Hist. iv, 1869, p. 383.  
Length 16 mm. = .64 inches. *Hab.*—Nevada, Vanc.

Color variable, rufous or piceous. The form is more robust than the preceding, and the elytra are roughly punctured with a strongly marked impression near the suture and slightly oblique. Near the tip is a sharply defined transverse impression, behind which the tip is obliquely elevated.

**N. cavipennis** Lec., S. M. C. No. 264, p. 204.  
Length 18—22 mm. = .72—.88 mm. *Hab.*—Cala.

Color is variable as in the preceding, which it strongly resembles. It is, however, stouter, and besides the differences in antennæ stated in above table, the elytra are impressed nearer the tip, which is more suddenly concave.

### ENCYCLOPINI.

This tribe contains three genera, each represented by a single species. The generic characters briefly are :

Tarsi wider, joints 1—3 brushlike beneath . . . . . **Pyrotichus.**

Tarsi slender, first joint very long.

Hind tarsi with basal joint sulcate, brushlike at sides . . . . . **Leptalia.**

Hind tarsi with basal joint cylindrical, not brushlike . . . . . **Encyclops.**

**P. vitticollis** Lec., J. A. P. 1862, p. 41.

Length 12 mm. = .48 inches. *Hab.*—Cala.

Black, opaque; with head, scutellum and three thoracic vittæ broadly fulvo-pubescent; elytra coarsely punctured, margin behind and at apex reflexed, tip feebly truncate. In each of the elytral punctures is contained a very minute brown hair.

**L. macilentæ** Mann., Bull. Mosc. 1853, iii, p. 253; Lacord., Gen. Col. 1869, p. 446.

Length 8 mm. = .32 inches. *Hab.*—Alaska.

Black, densely punctured; prothorax narrower than the head, deeply constricted before and behind, the sides obtusely, but strongly dilated; elytra elongate, parallel, feebly truncate at tip. Antennæ long and slender as in *Encyclops*, to which this insect is closely allied. The elytra are sometimes yellow, with suture and broad sublateral vitta black.

Var. **frankenhauseri** Mann., l. c.

The elytra are yellow, with one black vitta only, and the legs are testaceous.

Var. **fuscicollis** Lec., Ent. Rept. 1857, p. 65; Ann. Nat. Hist. iv, 1869, p. 383.

Length 10 mm. = .40 inches. *Hab.*—Or., Vanc., Cala.

The elytral vitta is very indistinct, and the body is testaceous. The legs are testaceous, sometimes varied with black.

**E. cœruleus** Say, J. A. P. v, 2, 1827, p. 280; Lec., J. A. P. ser. 2, i, 1850, p. 317; *pallipes* Newm., Ent. Mag. v, p. 392.

Length 7—8 mm. = .28—.32 inches. *Hab.*—Can., Ct., L. Sup., N. Ill., N. Y.

Very elongate and slender, green or blue, shining and coarsely punctured; legs and antennæ very slender, testaceous; thorax narrower than head, tuberculate at sides; elytra parallel, sparsely rounded at tip.

(To be continued.)

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## A New Orthopter from Tennessee.

BY DR. F. W. GODING.

**Stetheophyma doranii** n. sp. Vertex swollen at border of eyes; no medial ridge extending over top of head as in *lineata*, but top flattened, slightly sulcate; foveolæ medium, shallow, triangular. Pronotum finely punctured;

lateral carinae divergent, subdistinct on anterior half, somewhat prominent on posterior half, not broken. Elytra long, narrow, strongly swollen, curve 5 mm. from base, on costal border. Color dark brown, spotted with ochreous; markings of head and pronotum as in *gracilis*. Ochreous along costal edge for about half the length, remainder and dot or swollen curve, black; no such broad band as in *lineata*; three interrupted ochreous bands pass from costa over suture to costa; dirty yellowish stripe along each lateral angle from base of elytra nearly to apex of abdomen; apex translucent, dusky. Basal two-thirds of wings bright lemon-yellow, fuliginous band passing over outer third, apex translucent, fuscous. Front and middle legs dirty ochreous; hind femora ochreous, apex black, basal half of inner side shining fuscous with spot of same color between it and apex; swollen and flattened at base. Hind tibiae brownish olive, with band of yellow near base; tips of spines black. Hind tarsi and spurs of tibiae piceous. Length to apex of elytra 28 mm.; elytra 19 mm.; hind femora 12 mm. (type in F. W. G. coll.)

*Habitat*.—East Tennessee.

Described from one female named in honor of Prof. E. W. Doran, State Entomologist of Tennessee, who kindly furnished the specimen.

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### Preparatory Stages of *Plusia Californica*.

BY HARRISON G. DYAR.

*Egg*.—Hemispherical rounded at the base, the apex with a rounded depression. Finely creased vertically. Color pale yellow.

*First larval stage*.—Head somewhat cordate, black and shiny. Cervical spot and thoracic legs faintly blackish. Body pale yellow, with black hairs. The larva eat the under part of the leaf and rest on the abdominal legs with the body bent up in a closed loop, the head touching the leaf. They walk like a geometer, as the last three pairs of legs only are present. Duration of this stage three days.

*Second larval stage*.—Head whitish. Body green, with a transverse row of black spots per segment bearing black hairs. A subdorsal and a stigmatal whitish line. Joint 12 is enlarged, as in many noctuid larvæ.

*Third larval stage*.—Head greenish, with minute black dots and black hairs; jaws reddish. Body green, with white piliferous dots having black centres. On joints 5, 6 and 7 is a distinct black spot in the subdorsal space. A narrow subdorsal and broader stigmatal white line, the former supplemented by two indistinct longitudinal white streaks. Body furnished with a few black hairs. Length about 7 mm.

Duration of this stage three days.

*Fourth larval stage.*—Head green, with minute brown speckles and a few black hairs; eyes, jaws and palpi brown. Body green, a broad white stigmatal line, a narrow subdorsal one and two more in the subdorsal space also white. The upper of these lines is somewhat wavy and interrupted, and the lower one is broader than the subdorsal line. On each joint two rows of white dots with black centres bearing short black hairs. The spots alternate on the middle joints. Thoracic feet tinged with blackish, the abdominal concolorous with the body. Length about 12 mm.

Duration three days. During this stage and subsequently the larva eat the whole leaf instead of the lower portion as previously. If disturbed, the insect curls spirally and falls to the ground with contortions.

*Fifth larval stage.*—Mature larva. Head shiny green, jaws brown, palpi black. In some examples there is a black stripe on the head. Body dark green, the lines as in the previous stage, the stigmatal ending sharply above, but blended ventrally.

The elevated spots bearing white hairs are whitish, except the suprastigmal ones, which still have black centres. Cervical spot and anal plates dull pale green. The stigmatal space and venter have some minute white spots, and on each joint from 5 to 10 inclusive, there is a small black dorsal spot situated anteriorly. Spiracles white in a black oval. Thoracic feet blackish; joint 12 is slightly enlarged and joint 13 is small. The abdominal legs throughout its history, consists of only three pair on joints 9, 10 and 13, and the larva walks like a geometer. Length 25 mm.

Duration of this stage four days.

The insect spins a thin web of white silk in which to pupate, drawing together any loose objects to assist in covering it, and this operation, together with the preparation for pupation, occupies two days.

*Pupa.*—Depressed somewhat above the wing cases at back of the thorax, the eyes prominent, the tongue case projecting below the wing cases, forming a round prominence over the first abdominal segment. The cremaster is short and blunt, and the hooks with which it is furnished, are fastened in the silk of the cocoon. Wing cases slightly creased. Color brownish black, but paler at the joinings of the parts and between the abdominal joints. In occasional instances the whole pupa is pale.

Duration of this stage twelve days.

*Food-Plant.*—Malva. Larvæ from Los Angeles County, Cal.

For the determination of this species I am indebted to the kindness of Prof. John B. Smith.

FOOD-PLANTS OF LEPIDOPTERA No. 13.

(HALISIDOTA CARVÆ, *Harr.*)

BY WM. BEUTENMÜLLER.

TILIACEÆ.

- Tilia Americana, L. (Basswood).
- “ Europea (European Linden).
- “ alba, Michx. (White Linden).

SAPINDACEÆ.

- Acer dasycarpum, Chr. (Silver Maple).
- “ rubrum, L. (Red Maple).
- “ pseudoplatanus, L.
- Negundo aceroides, Moench. (Box Elder).

ROSACEÆ.

- Prunus serotina, Ehr. (Wild black cherry).
- “ Virginiana, L. (choke cherry).
- Pyrus malus, Tourn. (apple).

HAMAMELACEÆ.

- Hamamelis Virginica, L. (Witch-hazel).

OLEACEÆ.

- Fraxinus Americana, L. (White Ash).

URTICACEÆ.

- Ulmus Americana, L. (American Elm).
- “ fulva, Michx. (Slippery Elm).
- “ campestris, L. (English Field Elm).
- Celtis occidentalis, L. (Hackberry).

PLATANACEÆ.

- Platanus occidentalis, L. (Sycamore).
- “ orientalis, L. (Oriental Plane).

CUPULIFERA.

- Quercus alba, L. (White Oak).
- “ rubra (Red Oak).
- “ palustris, Du Roi (Pin Oak).
- Castania vesca, L. (Chestnut).
- Fagus ferruginea, Ait (America Beech).
- Carpinus Americana, Michx. (Hornbeam).

BETULACEÆ.

- Betula alba, L. (White Birch).
- “ populifolia, Spach.
- “ papyrifera, Marsh. (Paper Birch).
- Alnus serrulata, Willd. (Black Alder).

JUGLANDACEÆ.

- Juglans nigra, L. (Black Walnut).
- “ cinerea, L. (Butternut).
- Carya alba, Nutt. (Shell-bark Hickory).
- “ tomentosa, Nutt. (Bull nut).
- “ porcina, Nutt. (Pig nut).

NOTES AND NEWS.

A supplement to the "Catalogue of the Coleoptera common to North America, northern Asia and Europe is in course of preparation. Information of the capture in North America of the following species and other cosmopolites is greatly desired, and those having any of them in their collections will receive due credit if they communicate them to the undersigned before long; few of them have even a name in our literature, and it will be of value to science to place the fact on record if any of them exist in American collections:

Falagria longipes (*fovea, currax*), Thectura (*Dinarea*) angustula, Phlæopora latens (*major*), Homolota cavifrons, H. picipes (*parva*), H. coriaria, H. divisa, H. palustris, H. aquatica, H. ovaria, H. graminicola, H. sulcifrons (*pavens*), Aleochara puberula (*vaga, dubia*), A. morion, A. verna (*binotata*), Microglossa suturalis (*prætextata*), Sipalia hæmorrhoidalis Heer (*fumida*), Placusa complanata Er., Oligota pumilio (*pedalis*), O. pusillima, Gyrophæna strictula, Baptoninus longiceps, Xantholinus punctulatus, Medon debilicornis (*asteria, effluens*), Hypociptus læviusculus, Mycetoporus punctus, M. punctipennis, M. brunneus, Bledius opacus, Oxytelus laqueatus (*luteipennis*), Trogophlœus bilineatus, T. fuliginosus, T. gracilis (*tenellus*), Acidota quadrum, var. alpinum, A. brachypterum, Homalium cæsum, Scymnus arcuatus, Læmophlœus fractipennis, Cryptophagus scutangulus, C. affinis, Atomaria apicalis, Dermestes peruvianus (*hæmorrhoidalis*), Lathridius transversus, L. (Melanophthalma) gibbosa, Corticaria fulva, Ostoma (*Peltis*) grossum, O. oblongulum, Lophocoterus (gen. of Trogosit.) pusillus, Lyctus brunneus Tribolium confusum. All Rhyncophoræ not in the Catalogue.

JOHN HAMILTON, 18 Ohio St., Allegheny, Pa.

WE are to have a new entomological journal, to be published under the auspices of the Entomological Section of the Academy of Natural Sciences of Philadelphia, and the American Entomological Society.

It is to be called "Entomological News," and to cost one dollar per annum, for ten numbers of sixteen pages each.

The editor is Mr. Eugene M. Aaron; the advisory committee: George H. Horn, M.D., E. T. Cresson, Henry Skinner, M.D. and Philip P. Calvert.

There is room for a journal to cover the field proposed to be covered by this paper, and if it is as well done as it ought to be by the gentlemen above named, it will be indispensable for every working entomologist.

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**Bibliographical Catalogue of the described transformations of North American Lepidoptera** by Henry Edwards. Bulletin No. 35 of the U. S. National Museum.

No more generally useful, and to the Lepidopterist indispensable work, has been issued for some time. It is a valuable guide to those who breed insects, for it enables them to see what has been done, and to fill up omissions. It ought to prevent the continual redescription of species described in all stages *ad nauseum*, while some of the many species that I know have been bred should now be published.

According to this list a grand total of 1069 species are known in some of the early stages. Of these the *Rhopalocera* have 180 species, the *Sphingidæ* 55; *Sesiidæ*, 16; *Zygænidæ* (!!!), 13; *Bombyces*, 178; *Noctuidæ*, 188; *Geometridæ*, 101; *Pyralidæ*, 39; *Tortricidæ*, 61; *Tineidæ*, 222; *Pterophoridæ*, 16.

Mr. Edwards deserves the thanks of all Lepidopterists for this painstaking and extremely useful work.

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## New Species of Mexican Lepidoptera.

BY WM. SCHAUS, JR.

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### ERYCINIDÆ.

#### Subfamily ERYCININÆ.

**Caria melicerta** n. sp. Above deep brown, with a slightly lilacine bloom on the wings; several indistinct wavy transverse bands of a darker shade of brown. The outer margins reddish brown divided by a steel gray line; a submarginal dark line outwardly bordered on the secondaries by a metallic green streak, and about the center of the costal margin of the primaries is a cluster of metallic green scales. Underneath reddish brown, darker at the apex of the primaries, spotted with black. Along the costal margin of the primaries a series of metallic gray spots, a marginal line of the same character on the primaries, and a marginal and submarginal row of similar spots on the secondaries. The ♀ differs above in being paler, having the transverse bands

more distinct and broken into a series of spots. Underneath the wings are yellowish brown and all the spots are metallic gray, in some instances faintly outlined with black. Expands 23—25 mm.; 8 ♂♂ 2 ♀♀.

Paso de San Juan.

This species is near *Caria ino*, Godman & Salvin.

**Lasaiia sessilis** n. sp. Primaries above dark lustrous gray crossed by irregular black lines, a marginal row of dark spots and a submarginal dark wavy band. Underneath paler with the transverse lines broken up into spots, the marginal spots very small and the submarginal wavy band decidedly indistinct, especially on the primaries. Expands 28 mm.; 4 ♂♂.

Coatepec.

**Theope eupolis** n. sp. Primaries above black, with a small patch of blue at the base of the inner margin, and hardly extending above the median vein. Secondaries blue, with the costal margin, and the apical half of the outer margin broadly black. Underneath light brown with, at the anal angle, two or three indistinct black spots edged inwardly with light blue. Expanse 30—35 mm.; 2 ♂♂ 3 ♀♀.

Paso de San Juan.

This species comes very close to *Theope virgelius* Fabr., but is easily recognized by the smaller extent of blue on the primaries and the black margin to the secondaries.

**Theope bacenis** n. sp. Primaries above black, with a large bright blue space at the base along the inner margin. This color does not extend above the subcostal vein, nor beyond the cell. At the end of the cell is a band. Secondaries, which are rather produced at the anal angle, bright blue. The costal margin black. Underneath brown, yellowish at the base of the primaries, the wings being crossed from the apex of the primaries to the center of the anal margin by a dark brown band. Expands 33 mm.; 1 ♂.

Coatepec.

## SPHINGIDÆ.

### Subfamily MACROGLOSSINÆ.

**Enyo tædium** n. sp. The male closely allied to the male of *Enyo gorgon*, having the same general aspect and peculiar fold of the cell as in that species. The costal margin is, however, straighter, the wings are not so long, and the body is also shorter and less tapering than in *Enyo gorgon*. Primaries reddish brown crossed by numerous wavy bands of a deeper brown. The apical portion of the wing is rather darker, except a lighter space situate along the center of the outer margin and inwardly curved. On the costal margin close to the apex is a small dark brown triangular spot. Secondaries reddish brown, darkest at their base and with a central and submarginal wavy brown line. Underneath reddish brown, gray along the outer margin of the primaries with two wavy brown lines crossing the wings beyond the cells. Head reddish brown. Thorax brown, with a darker shade crossing the patagiæ.

Abdomen brown, with dorsal tufts of curly scales and a dark brown spot on the anal segment; the anal lateral tufts also darker brown. Expanse 57 mm.; 2 ♂♂.

Jalapa, Coatepec.

**Enyo riscus** n. sp. Primaries above brown with a purplish gloss, crossed by several wavy brown lines from the costal to the inner margins. A conspicuous dark curved line extends from the apex to the internal angle, enclosing the outer marginal space, which is of a darker purplish brown than the rest of the wing. Secondaries purplish brown with the base, the inner margin narrowly, and the costal margin broadly yellow, the dark portion of the wing being crossed by a few wavy brown lines. Underneath wings yellow, thickly speckled with brown scales, the outer margins of the primaries with the same markings as on the upper side, but not so dark, and between this space and the cell three wavy brown lines cross the wing from the costal margin to the inner margin. On the secondaries the outer margin is broadly bordered with purplish brown and the wing is also crossed by two distinct wavy brown lines from the costal margin to the anal angle. Head, thorax and abdomen purple brown above, with a dark subdorsal line. Underneath yellowish, speckled with brown. Expanse 53 mm.; 1 ♂.

Rinconada.

**Calliomma germen** n. sp. Primaries above dark olivaceous gray, with an indistinct inner and an outer transverse wavy band of a darker shade. A marginal row of small dark spots, beyond which the wing is thickly speckled with blackish scales. Fringe brown. Secondaries brownish black; fringe alternately brown and white. Underneath light greenish gray, the wings thickly speckled with short dark streaks, except the basal half of the primaries, which is clothed with long dark brown scales. Head and thorax greenish; a white line behind the eyes. Abdomen brownish gray above, whitish underneath. Expanse 62 mm.; 1 ♂.

Coatepec.

**Pergesa mexicana** n. sp. Primaries above olive-brown, paler along the outer margin; an indistinct inner curved band from the costal margin to the base of the submedian vein; also three outer contiguous transverse wavy bands of a slightly darker shade, and beyond these a marginal row of small spots, about the center of which is a cluster of black scales, and the outer margin is speckled with short black streaks. Fringe brown. Secondaries brown; fringe brown, whitish at the anal angle. Underneath greenish brown, speckled with black, lighter than the upper side, except the base and central portion of the primaries, which are dark olivaceous brown. On both primaries and secondaries a conspicuous marginal row of small black spots. Head and thorax olive-brown with a pinkish streak extending from the antennæ along the sides of the thorax. Abdomen above olive-brown, underneath pink. Expanse ♂ 55 mm.; ♀ 70 mm. 3 ♂♂ 1 ♀.

Paso de San Juan.

(To be continued.)

# ENTOMOLOGICA AMERICANA

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No. 2.

## NEW CYNIPIDÆ.

BY C. P. GILLETTE.

ON BUR-OAK (*Quercus macrocarpa*).

**Neuroterus flavipes** n. sp. Gall.—A hard woody swelling of the mid-rib or one of the main veins of a leaf, the leaf becoming much wrinkled and deformed as the result. Large galls measure three-fourths of an inch in length and one-fourth of an inch in width. The flies usually escape from the upper surface, sometimes through a slightly raised teat-like projection.

Galls were gathered at Ames, Iowa, July 6, 1888, from which the flies had already begun to issue.

Gall-fly—Female.—Head, thorax and abdomen black; antennæ and legs light yellow; length 1.6 mm.

Head entirely black, face very sparsely set with short gray hairs and finely rugose; vertex, genæ and occiput finely rugose. Antennæ 13-jointed, first two joints stout, and nearly equal in length, third joint longest, fourth to thirteenth subequal in length, last six or seven joints forming a slight club; color light yellow. Thorax black, finely rugose, densely pitted on the shoulders, and very thinly set with short gray pubescence. Two shining, black, parallel lines, begin at the collar and run back about half way to the scutellum. Parapsidal grooves shallow, and can be traced about two-thirds of the way from the scutellum to the collar. Outside of each parapsidal groove is a short depressed line beginning near the base of the scutellum and running parallel with the groove past the base of the wing. Scutellum entirely black, densely pitted, and with two shallow foveæ that are almost obsolete. Legs light yellow, with the thighs and tibiæ dark, sometimes almost black; base of coxæ and pulvilli black. Abdomen black, polished, and with very few hairs. Ovipositor sheaths protruding. Wings hyaline; veins rather slender and light yellow in color, areolet wanting, cubitus and anal vein almost obsolete, and the radial nervure not reaching the costal margin. The anterior

wings are without a fringe of hairs upon their borders and the hairs upon the surface of the wings are not well developed, but appear in most cases as minute specks. Described from thirteen reared specimens.

Male.—Antennæ 15-jointed, filiform, and longer than the body; parapsidal grooves more distinct than in the female; wings with fringe of hairs and hairs better developed on the surface of the wing. Length 1.4 mm.; otherwise as female.

**Neuroterus vernus** n. sp. Galls.—Almost identical with those of *Neuroterus minuta* Bass. When occurring upon the leaves they are simply enlarged petioles, but the leaf usually becomes very much dwarfed and deformed. The galls also occur in large numbers on the stamen catkins, in which case the catkins become much enlarged and irregularly swollen, and remain green upon the tree until the gall-flies within have completed their growth. The eggs are deposited in the buds of the bur-oak early in April, and the flies issue early in June. Galls taken June 10, 1888, had lost most of their flies. On April 9, 1889, the tree from which these galls were taken was again visited, the day being warm and bright, and the females found present in great numbers busily depositing their eggs. From one to a half dozen or more of these flies were present upon every bud, into which their ovipositors were deeply inserted. The galls resulting from eggs deposited at this time, began to give a second brood of flies May 16th. The tree was also visited on a bright day about the middle of April for the purpose of determining whether or not the egg-laying had ceased. At this time no living flies could be found, but many dead ones were seen that had not been able to remove their ovipositors from the place where the last eggs were laid. At this time the twigs of the tree were literally covered with what would be termed "honey-dew" which had oozed out from the myriad punctures that the buds had sustained a week or ten days before. This shiny, sticky material tasted very sweet, and one who did not know what had happened to the tree a few days previous might well wonder what could be the source of this sweet substance if it did not gather as a dew. This is one of the most abundant of the gall-flies in this vicinity where a bur-oak tree can hardly be found, the foliage of which has not been seriously damaged by it.

Gall-fly—Female.—Except joints of legs and tarsi, black; these parts yellowish brown; antennæ 12-jointed, the second joint most robust; 1—1.3 mm. in length.

Face smooth, shining black, or very finely rugose, and with very few hairs. Mandibles black at tip, and black or brown-black at base; palpi brown; antennæ with first and second joints stout and subequal in length, third joint longest and most slender, joints somewhat enlarging towards the

tip; making a very slight club, terminal joint but slightly longer than the preceding, and each joint with a few short hairs. The antenna reaches slightly beyond the thorax and is composed of twelve joints. Sometimes the terminal joint, when in a favorable light, appears to be divided into two. Thorax polished and without parapsidal grooves or hairs. The mesothorax is notched posteriorly, making the scutellum appear unifoveate. Scutellum smooth and polished, and with a few scattering hairs, but no foveæ. Abdomen short, truncate, entirely black and polished. Ovipositor sheaths usually not visible; when the ovipositor is exerted full length it is longer than the abdomen. Wings 1.5 mm. in length; radial nervure not reaching the costal margin; areolet large, but rather indistinct on account of the second transverse nervure being very faint; cubital nervure visible, nervures brown. Joints of legs and tarsi brown, last joint of tarsi infusate. Described from a large number of flies that were reared from the galls in May.

June Brood. Seven flies before me that came from the galls upon the leaves in June, 1888, differ from the preceding by having more light colored parts. The base of the mandibles, first three or four joints of the antennæ and feet are distinctly lighter colored. In some cases the anterior tibiæ and the greater part of the anterior femurs are distinctly whitish, and the antennæ are distinctly 13-jointed. Only females were obtained.

ON WHITE-OAK (*Quercus alba*).

**Acraspis niger** n. sp. Galls.—Small, brown, globular bodies, densely covered with a grayish pubescence which gives them the appearance of felt on their outer surface, attached to the under surface of the leaves of the white-oak in September and October. Galls exactly similar are very common on the leaves of the bur-oak (*Quercus macrocarpa*), but from these I have not succeeded in rearing the flies. Internally these galls have a fragile central cell surrounded and held in place by a dense growth of dark brown radiating fibres. The galls resemble very closely those in my collection of *Acraspis lanæglobuli* Ash.

Gall-fly—Female.—Color black, with a little reddish brown on the thorax; thorax covered with a recumbent silvery pubescence; abortive wings reaching the middle of the abdomen.

Head entirely black, finely rugose, and with very few hairs. Antennæ 14-jointed, very dark brown or black, and 2.5 mm. in length. Thorax black, with a little reddish brown above, covered with a recumbent silvery-white pubescence, the hairs rising from minute punctures in a polished surface. Scutellum small, finely rugose, without foveæ, and covered with hair like the thorax. Abdomen highly polished, with a small patch of silvery pubescence on the anterior inferior portion of the second segment. Venter tipped with a conspicuous tuft of yellowish gray hairs. Legs, except basal portion of coxæ, dark brown and densely set throughout with short gray hairs; aborted

wings reaching a little beyond the middle of the abdomen. Described from a single specimen, the only one that I have been able to rear from hundreds of galls that I have collected both in Michigan and Iowa.

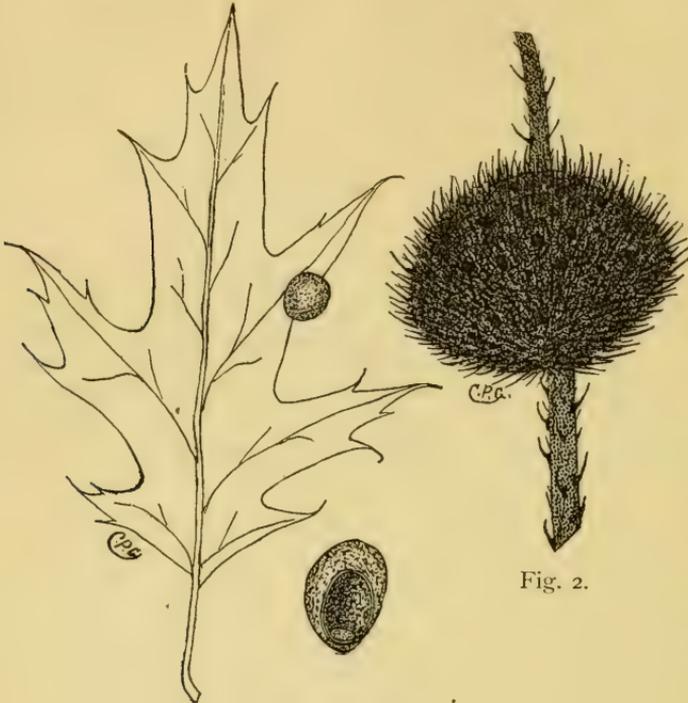


Fig. 1.

Fig. 2.

ON RED AND SCARLET OAKS (*Quercus rubra* and *Q. coccinea*)

**Dryophanta liberæcellulæ** n. sp. Gall.—Globular excrescences on the leaves of the red and scarlet oaks sometimes taking into themselves the entire leaf tissue and at others surrounded by the blade of the leaf as is the case of *Amphibolips nubilipennis* or *Andricus singularis*, either of which it very much resembles, but from which it differs by having a somewhat roughened and fuzzy exterior and a much thicker outer wall, and by having the larval cell perfectly free to roll about within. The galls vary from 6.5 mm. to 9.5 mm. in diameter. See fig. 1.

When gathering the galls on May 20, 1889, it was noticed that some of the flies had already escaped, and on May 28th occasional galls could be found with the flies still in them. I have taken several of these galls in Michigan, but obtained only parasites from them.

Gall-fly.—Black; feet, first four or five joints of antennæ and the palpi light yellow.

Female.—Head shining black, with two deep pits at the base of the clypeus, one on either side; face finely rugose; mandibles black, sometimes yellowish at base; palpi light yellow to yellowish brown. Antennæ 14-jointed, first four or five joints light yellow, terminal joints black, first and second joints short and stout, third joint longest, terminal joint cone shaped and a little longer than the penultimate. Thorax shining black and finely rugose, parapsidal grooves distinct; a medium impressed line begins at the scutellum between the parapsidal grooves and extends a short distance upon the thorax. Scutellum polished, bifoveate and more coarsely rugose than the thorax. Abdomen entirely black and polished; ovipositor sheaths slightly exerted and light yellow in color. Wings slightly smoky, and 3 mm. in length, areolet very small or entirely wanting. Feet light yellow, except last tarsus, which is black. Length 2.3 mm. Described from twelve reared specimens.

Male.—Length 2 mm. The yellow coloration of the antennæ shows for nearly the entire length on the under surface, the number of joints is fifteen, and they are more densely set with hairs than in the female. Otherwise as female. Eight reared specimens.

ON A ROSE BUSH.

*Rhodites multispinosa* n. sp. Gall.\*—A large knot-like excrescence on a young shoot of a species of *Rosa*. The gall is reddish brown in color and densely set with sharp, stout spines, like those which occur upon stems of the bush. See fig. 2.

Gall-fly—Female.—Head rufous, almost black beneath the eyes, finely rugose and covered with gray pubescence. A little black shading on the vertex surrounds the ocelli. Thorax rufous, punctured, parapsidal grooves broad, but not deep, and extended to the scutellum. Two naked parallel lines extend a little more than one-third of the distance from the collar to the scutellum between the parapsidal grooves. Thorax, like the head, thinly set with short hairs. Scutellum more coarsely rugose than the other parts of the thorax and without foveæ. Abdomen dark rufous, polished and very finely rugose. Ventral valve black. Antennæ 14-jointed, first three joints rufous, the others black. Wings subhyaline, areolet large, marginal cell open. Length 4.3 mm.

Male.—Entirely black, except the legs and a little rufous coloring about the ocelli. Legs reddish brown. Antennæ 14-jointed, and nearly or quite as long as the body. Length 3.5 mm. Otherwise like the female.

The gall and flies of this species were kindly loaned me by Prof. Osborn, of the Iowa Agricultural College.

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\* This is probably the gall spoken of by Osten Sacken on page 44 of the Proceedings of the Entomological Society of Philadelphia for 1863, Vol. II. In Bulletin 7 of the Iowa Experiment Station the specific name *spinosissima* was given to this insect without noticing the fact that a very similar specific name, *spinosissima* had already been used by Giraud for a related European Cynipid. In order to avoid confusion from having two names so similar in the same genus I have thought it best to change the name here to *multispinosa*.

## A New Species of *Feralia*.

BY JOHN B. SMITH.

**F. major** n. sp.—General color of head, thorax and primaries a rather light bluish green fading to yellowish in old specimens, more or less powdered with black. This black powdering usually prevails in the median space of primaries, but sometimes invades the entire surface, so that the insect is really black, with a few green scales only. Usually the basal and terminal spaces, and the costal region, are green, while the median space is blackish. Described from a distinctly written specimen the markings are as follows: Basal line evident, single. T. a. line single, black, with three outward angulations, the longest and broadest in the submedian interspace; an evident, single, black, irregularly sinuate and angulate median line. T. p. line well removed outwardly, as a whole nearly parallel with outer margin, but with an outward angulation on vein 4, and an incurve over the anal angle. Opposite this curve a little black spur projects into the terminal space in most specimens. There is no s. t. line. Orbicular large, round, very indefinite, usually defined at the sides, rarely beneath, never above. The cell is black between this spot and the reniform. The latter is large, always traceable, usually well and completely defined by a black margin, in well marked specimens also, by an interior ring of white scales. Fringes greenish at base, blackish cut with white outwardly. These markings are traceable on even the darkest specimens I have seen. Thorax a variable mixture of black and green, never with definite lines. Secondaries pale, smoky fuscous, tending to become paler marginally. Beneath pale, powdery, usually with an inner and exterior common line, between which on secondaries is a distinct discal spot. These lines, however, are very variably distinct, and on the primaries usually obsolete. Expands 34—36 mm.; 1.36—1.44 inches.

*Habitat.*—Washington, D. C., Franconia, N. H., and Plattsburgh, N. Y.

Mr. G. H. Hudson, of Plattsburgh, to whose kindness I owe the chance of seeing a good series, has taken seven specimens, all at electric light, as follows: 1887, May 3, 8, 16 (2), 19; 1889, April 18, 28. Of these, two are now in the U. S. National Museum. Mrs. Slosson has taken a specimen at Franconia, and Mr. Schoenborn has a very perfect specimen, also taken at light in Washington very early in the year.

In all essential characters this species is a close ally of *F. jocosa*, the lines being almost identical in course, but it is not that form which shows a black median space. In *jocosa* the lines are always distinct, and the white accompanying shades marked, while the thorax has the patagiæ always neatly black lined. There is none of the powdery appearance so distinct in the new species, and finally, besides the smaller size *jocosa* has the secondaries black. The harpes of the male are in all essentials similar in both species, but the spur from the lower angle is different.

## PLATYPSYLLUS—EGG AND ULTIMATE LARVA— Dr. Horn's Reclamation.

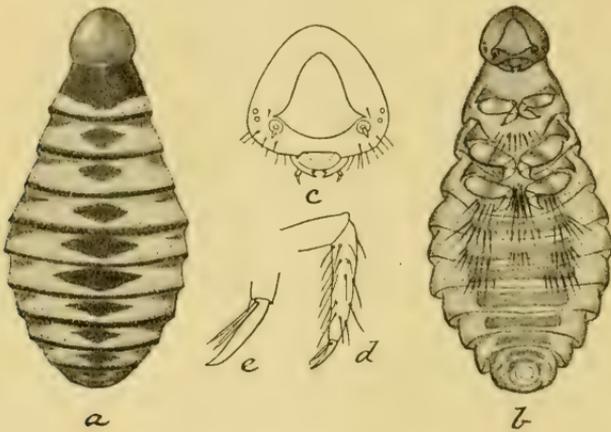
BY C. V. RILEY.

The egg and the pupa of *Platypsyllus* are yet unknown. I have for some time endeavored to obtain them, and specimens recently received as such gave hope, from the finder's account, that the lacunæ in the life-history of the genus might at last be filled. But examination dispelled the hope; yet not without adding something to our knowledge of the development of this curious beaver parasite. The only reference to the egg is that contained in Dr. Horn's article in the "Transactions of the American Entomological Society (Vol. XV, p. 25)," where it is stated that the eggs were observed, and that "they are minute objects, not fastened to the hair, as is the case with lice, but plastered firmly to the skin among the thickest hair." This, failing in description, might apply to the egg of any other minute creature, and I have, in fact, some reason for concluding that the objects referred to in the observation were not the eggs of *Platypsyllus*, but those of quite a different insect. The eggs, as observed in the oviduct of the female *Platypsyllus*, are sufficiently uncharacteristic, except as to their flattened form; they are 0.4 mm. long and 0.2 mm. in broadest diameter, non-sculptured, white, broadly ovoid, but much flattened on two sides. The structure indicates that they may either be thrust under the scales of the skin or fastened thereto.

What was sent as the pupa, proves to be a most interesting larval stage and in keeping with the Mallophagous appearance of the beetle. This larval stage might at first sight be characterized as a Mallophagan by even the most careful zöologist. The larva, as hitherto described and figured, even in the largest specimens, whether from Dr. Horn's material or my own, has always seemed to me inexplicably small as compared with the imago, and if the form which I now describe is (and I can believe it nothing else) the final larval form of *Platypsyllus*, then the larvæ hitherto described had not yet gone through their final molt. A glance at the accompanying figures suffices to show the remarkable superficial resemblance to the lice in question, and only when the structure, especially of the leg and mouth-parts is studied, does its *Platypsyllus* nature appear. The description will also show how greatly it is modified from the earlier larval stages already described. One is justified from the facilities for grasping which it possesses, as from the position of the head, in inferring this stage quiescent, and in this respect,

as well as in the marked deviation from the previous stage, it recalls the pseudo-pupa, or coarctate larva of the Meloids, and of some other parasitic forms. I have but a single specimen and have not been able to clearly make out the spiracles. One can but conjecture as to whether the pupa proper is formed, either partially or wholly, within the skin of this broadened larva, or whether the skin is completely exuviated in the transformation.

I hope that those who have opportunity to capture beavers will endeavor to obtain the much-desired pupa, and I shall be most glad to communicate with or to receive specimens from any one having such opportunity.



*a*, dorsal; *b*, ventral view; *c*, head from beneath; *d*, tarsus; *e*, tarsal claw (original).

**Platypyllus castoris.**—*Ultimate Larva*.—Length about 2.4 mm.; greatest diameter about 1.2 mm. Nirmiform, flattened, narrowest at thoracic joints and broadest at middle of abdomen. Color grayish white, with brownish, chitinous markings. Head pale brown, peculiar, projecting from joint 1, subtriangular, flattened, occiput without structure, face and vertex completely ventral; the mandibles resting on the prosternum, rather stout and 2-toothed; clypeus very large, triangular; antennæ very small, 3-jointed, inserted in front of the lateral angles of the clypeus, the basal joint rather large, circular, flattened, disc-like, the second joint minute, as long as broad; the terminal joint much longer, slender, cylindrical, and bearing a stout bristle at tip; labrum transparent and membranous; palpi apparently 4-jointed (not distinctly made out) the terminal joint cylindrical, about one-half longer than wide and truncated at tip; just outside the antennæ are two black ocelli and several piliferous raised points. Legs rather short, stout, drawn in over the sternum; the tarsi spinose, long, 1-jointed, bearing but a single, long, quite straight claw, with two long, movable spines at base; tibiæ with but a few spines near tip. Dorsally, the prothorax is twice as long as the other joints, which are subequal in width, and the transverse brown markings include the prothorax, except a narrow posterior band, a narrow posterior border across

each of the joints (obsolescing on 10, 11 and 12); a median subrhomboidal spot and a subdorsal narrower, somewhat paler spot near the anterior margin of each of joints 2-11. The posterior half of each joint is also beset with numerous pale brown granulations (obsolete on 11 and 12), but without a trace of hair. Ventrally, the thoracic joints are much lengthened, the femora show a transverse shade and the abdominal joints a dusky transverse band, shorter and more conspicuous anally. Patches of long, stout bristles occur on the dusky parts of joints 4, 5, 6, 7 more particularly, and of shorter bristles on the sternum.

While upon this subject of *Platypsyllus* I may remark that the note (page 122 of E. A. for last June) which appeared while I was in Paris amazed me not a little, and obliges me to jog Dr. Horn's memory with the following statement of facts:

1. The paper in "Insect Life," No. 10, as stated in the footnote was read April 20, 1888, before the National Academy. It was read by request. In it I distinctly refer to Dr. Horn's first announcement of the larva before the Washington Entomological Society.

2. I could not refer to his own paper on the subject, which was not published till sometime after mine was read. The date, March, 1888, on his signature is unjustified and misleading. My assistance, acknowledged in his paper, did not begin till April 10, 1888. I was in correspondence with him on the subject during the rest of the month, and asked for advance sheets of his paper in order to be able to refer to it; but the Doctor found it inconvenient to send them as his *Platypsyllus* paper formed part of a more general one. He was fully advised of my intention to read a paper, and when, unable to get his advance sheets, I concluded that it might be advantageous to have my conclusions as to details published independently and uninfluenced by his, he encouraged this course, as I had offered to defer to his wishes.

3. My paper was reproduced in "Insect Life" after I left for Paris, because few entomologists had seen it in the "Scientific American," to which it was sent after reading. In reproducing it I could not well have referred to Dr. Horn's paper, nor have made any change or addition whatever without preparing a supplementary paper to include subsequent notes both on *Platypsyllus*, *Leptinus* and *Leptinillus*, which, as the Doctor had reason to know, I was getting together. This I had then neither time nor inclination to do, because, to use the language of one of his own letters to me: "I want facts and ideas, and do not care who publishes."

What is it then that Dr. Horn reclaims? Not priority of announcement, because that is admitted for him in my paper. Not priority of publication, because I have made no claim to it. The

“omission” to refer to his paper I have explained. It remains only to add that Dr. Horn had no justification from my intercourse and correspondence with him, for supposing that I could have had any other reason for the “omission,” or that I shall fail to refer to his paper when occasion permits. The reclamation cannot refer to priority of discovery, because Dr. Horn had the best of reasons to know that I had the larva long before he obtained it, for I had informed him of the discovery already in October, 1887. That he should have ignored this fact in his announcement before our Washington Society will be thought by some “inexcusable,” and will explain why, as stated in the beginning, I was amazed at his card. I much preferred to attribute the neglect to forgetfulness and to believe that one whose work I had always admired was above the petty jealousies and narrow personalities which too often mar the conduct and writings of specialists.

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### A New Species of *Oncocnemis*.

BY JOHN B. SMITH.

***Oncocnemis extremis*** sp. nov.—Head and thorax ashen gray, with fine black powderings. Head with front of a somewhat creamy tint, hind margin deep seal-brown. Basal joint of palpi also seal-brown. Primaries ashen gray to just beyond the t. p. line; beyond this point the wing is even smoky black, with a brownish lustre. Basal line small, single, black. T. a. line single, broad, black, more like a band than a line, evenly and not strongly outcurved. T. p. line single, black, irregular, outcurved over cell, and then in a direct course to the margin. No trace of the s. t. line in the black outer space. A broad diffuse median shade from the middle of the costa, joining the t. p. line at one-half its course. No trace of the ordinary spots. Secondaries white, with a faint yellowish lustre, a broad black outer band, continuous with that of the primaries, and narrowing to a point at anal angle; within this is a narrow black line, obsolete before reaching the anal angle; base of wings clouded with black. Beneath the maculation of the upper side is faintly reproduced, the general color whitish, powdery. Expands 1.32 inches; 33 mm.

*Habitat*.—N. W. British Columbia.

A single specimen (♀) of this strongly marked species is before me. It is an unfortunate matter that our work on the Noctuids can be so short a time complete; hardly had my monographic work been received, before a new species quite different from anything before known, claims attention. The present form comes next to *homogena* in the series, agreeing with it in the group characters, and particularly in the single transverse lines. *Homogena*, however, has the median space darkest, while in this species the broad, outer, dusky margin is distinctive.

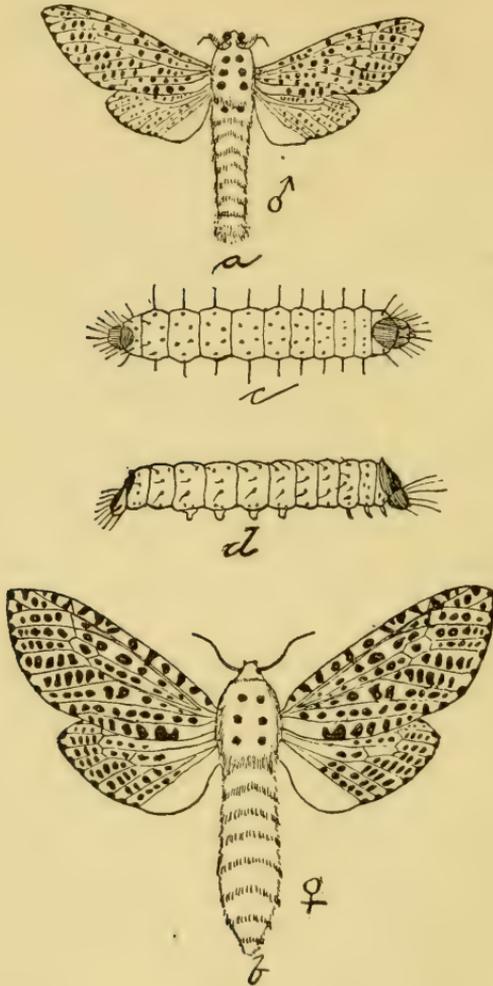
NOTES ON ZEUZERA PYRINA *Fab.*

BY C. P. MACHESNEY.

I notice in ENTOMOLOGICA AMERICANA Vol. IV, p. 162, and Vol. V, p. 7, articles by Mr. E. L. Graef and Mr. A. R. Grote, respectively, on *Zeuzera pyrina* (Fabr.), referring to specimens taken during 1887 and 1888 by my friend and co-laborer, Mr. J. B. Angelman, of Newark, N. J., which articles still leave the question in doubt as to whether or not the appearance of this insect in this locality results from an accidental importation in the earlier stages, or has it become indiginous to the country. In ENT. AM. Vol. V, p. 28, Mr. Angelman gives his observations on the "time of appearance," which he records as "from June 14th to September 27th, a period of 106 days," which I consider an evidence that *Z. pyrina* has established itself in this vicinity, and is increasing in number with considerable rapidity. During the past summer I occasionally took this insect in Arlington, N. J., though I had been unable to find it here last year at the time it appeared numerously in Newark, from which it may be inferred that it is gradually spreading, but to what extent can only be determined by observations in other parts of the State. The proof, however, that it has "come to stay," is presented herewith in a description of the larva, kindly provided me for the purpose, by Mr. Angelman, who, so far as I can learn, is the first to discover this borer in this locality, and presumably, in this country. The larvæ were found in November and December, 1888, in the topmost small branches of some very large old elms in Newark, which had been felled by order of the authorities. From the position in which the larvæ were found it would appear that the egg is deposited at the juncture of two small branches, as the excavation began at that point and extended downward through the centre of the branch, increasing in diameter as the larva attained its growth, thus leaving the wood around the cavity very thin at time of transformation and resulting in the death of the branch from where the imago had emerged to its extremity. At the time this description was made larvæ were not quite matured.

Larva  $1\frac{1}{4}$  inches in length, yellowish white in color. On the 2d to 11th segments each, are a number of minute black dots, varying in number from 10 to 14, slightly elevated and furnished with a very fine short hair (only perceptible in the smaller spots at this stage with the aid of a magnifying glass). These dots are placed on each segment, 4 dorsally, of which the anterior pair are closest together, and the remainder are lateral and sublateral. Head one-

half the width of the body, round, blackish brown, adorned with a few bristles, and placed well under the first segment. Segment one semicircular viewed dorsally, and somewhat triangular laterally, and not quite as wide as segment two. Cervical shield dark brown, slightly



projecting above dorsal part of segment. Larva of equal breadth from segment 2 to 10; segments 2 to 5 slightly shorter than segments 6 to 11; segment 12 adorned with a few bristles; anal shield dark brown; segment 11 also has a dark brown band across the posterior dorsal margin. Thoracic legs short, concolorous with body. Abdominal legs very small and retractile.

Owing to the difficulty of keeping the larvæ supplied with *live* wood, Mr. Angelman was unable to successfully rear them to the imago state, and while believing the identity of the insect to be beyond question at the time, I deferred presenting this description to the readers of ENTOMOLOGICA AMERICANA until I had seen the description and figures of *Z. æscula* (*pyrina*) of Europe as given in Kirby's "European Butterflies and Moths," plate 26, fig. 2 a b, with which the larva coincided in all particulars. Some empty pupa shells were also found in the branches of the same tree in cavities identical with those in which the larvæ occurred. These cavities were somewhat enlarged at the bottom, where the pupa lay inclined upward toward the opening through which the imago had escaped. The upper part of the cavities was filled with sawdust excrements solidly packed, the hole being large enough to enable the larva to reverse itself, it having been found "looped" several times. The pupa shells were in such an imperfect state as not to admit of a detailed description.

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### A Waspish Love-Struggle.

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Col. John Bowles, of this city, a reliable observer, and a gentleman who takes a keen interest in Nature, tells us of an interesting sight which he noticed last October in Richmond County, Ga. : Walking along a country road with two friends, an animated black and yellow ball as large as one's fist was noticed moving about on the ground. A closer look showed that the ball was composed of wasps; perhaps eight or ten smaller ones and one larger. It was not long before Col. Bowles discovered that the larger one was a female, while the others were all males struggling to mate with her. The female at first seemed disinclined, and held the tip of her abdomen turned under and out of their reach. Presently, however, she held it out and opened the valves, when immediately one of the males mated with her. Coition lasted not more than ten seconds, and after a few moments another male was allowed access. Meantime, the whole mass of males continued in the most frantic excitement, clawing and biting at the fortunate individual and at each other. They were watched until all but one of the males had copulated, when the female, seeming to tire, thrust out her sting and made an angry noise, at which the last male fled.

Col. Bowles is not familiar with the species of Digger-wasps, but from his description we think this one must have been either *Sphæcius speciosus*, or *Monedula carolina*.

L. O. H.

## NOTES AND NEWS.

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In an able Presidential address made by Mr. E. A. Schwarz before the Entomological Society of Washington, he reviews, in a general sort of way, the literature of American Entomology. Its development and nature were spoken of, as were also some of its characteristic features—good and bad. One remark struck us as remarkably pertinent, and would almost seem to suggest that sometime or other Mr. Schwarz has occupied an editorial position. He says that the chief peculiarity of the American Entomologist is, that he does not subscribe to the periodicals of his own country! It may be an overestimate when we say that there are not more than 250 entomologists in North America who regularly subscribe to an entomological journal. ENTOMOLOGICA AMERICANA sends out over 200 copies monthly, but of these many are to members, active and honorary, and many more are sent as exchanges. This is really a bad showing, and indicates how little encouragement entomologists give to journals published in their interest. ENT. AMER. costs annually over \$500 for printing, mailing and incidentals, and against this about \$250 comes from subscribers, slightly more, perhaps, during the last year. The balance is lessened somewhat by the sale of back volumes, but about \$200 remains as a deficit, to be met by the Society. Now, this has always been met, and will be met for the current and future volumes, but our readers could, with a little effort on their part, help us considerably by remitting promptly, by recommending the paper to their cronies interested in insects, and by adding a little to our publication-fund now and then when finances are in a flourishing condition. It does seem too bad that the few journals published in America should not be more generously supported.

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Our paper was late last month, and the last part of Vol. V was badly delayed. Complications resulting from the union of the Society with the Brooklyn Institute locked up our funds for nearly three months, and the cussedness of the former printer (proverbial and well understood) was responsible for the rest. We have gotten a new start now and hope to get along swimmingly in future.

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Mr. Ashmead is again at Jacksonville, Fla. He expects to leave for a European trip before many months, and will make studies in the famous collections there. He promises the completion of a monographic work on the *Proctotrupidae* before leaving.

## NEW CALIFORNIA HOMOPTERA.

BY E. P. VANDUZEE.

To the kindness of Mr. D. W. Coquillett, of Los Angeles, Cal., I am indebted for the opportunity of studying a very interesting series of Homoptera from the West coast. This collection has proved of great interest, not alone on account of the large number of new species it contains, but principally, perhaps, for the clearer light it throws on the relationship existing both between the American Homopterous fauna and that of Europe, and between the several members of our own Eastern fauna. A number of the new species here made known, falling into the older genera, seem to connect these with other genera, or to show a type of variation before unknown in this country. Thus *Thamnotettix subænea* reminds us, especially by its ornamentation, of *Scaphoideus*. *T. coquilletti*, in the same respect, recalls *Calliscarta*. *T. geminata* in most of its characters would be taken for a *Cicadula*, while *T. limbata* represents, possibly, a new generic type, related to *Thamnotettix*, as is the European *Anoterostemma* to *Athysanus*. *Deltoccephalus coquilletti* might readily be mistaken for an *Athysanus* and *Pediopsis nubila* for an *Agallia*. In *Jassus lactipennis* we have, perhaps, the smallest species of the true Jassids yet known, and very probably the type of a new genus of this interesting group, which includes such genera as *Jassus* Fab. (Stal.), *Terulia* Stal., *Petalopoda* Span., *Palicus* Stal., etc. *Allygus inscriptus* deserves notice as being the only North American species, at least as far as known to me, that falls exactly within the limits of the genus as characterized by Dr. Fieber.

Aside from the species described below, this collection contains fourteen forms of the *Typhlocybidæ* that I have not yet studied; three or four species the descriptions of which have been reserved for publication with related material from the East, which I hope will soon appear; a few forms that require the study of more extensive material before they can be satisfactorily characterized, and eleven that I have been able to identify with already described species.

Species absolutely identical with European forms are remarkably few in this collection,—only two have thus far been recognized and form a proportionately smaller element than in our Eastern fauna. But there are many species closely related to their European congeners, and it is not unlikely that, with a full series of the fornian *Jassidæ*, a very observable correspondence with th

pean fauna would appear. Comparisons of this character are, however, of little value without the study of more extensive material than we now possess. The first duty of our entomologists is to make known the numerous species occurring in their country; for, until this is done, we can have no accurate knowledge of our own fauna or of its relations to those of other countries. Then, too, will there appear a more general interest in these small and despised, albeit frequently beautiful creatures; and collectors will account them worthy of preservation when inadvertently taken by them while in quest of larger game, and students will not, as at present, be obliged to solicit in vain for exchanges, or go in person for the desired material, or do without it.

A few of the terms and measurements employed in the following descriptions possibly call for a word of explanation. The length of a specimen is measured from the tip of the head to the apex of the elytra, or of the abdomen if it projects beyond the elytra. Width of the head includes the eyes; width of the pronotum is supposed to be measured across at the widest point, generally at the lateral angles, or the angles between the lateral and latero-posterior margins. In the nomenclature of the venation I have adopted that employed by Dr. Fieber as in all respects the most convenient and satisfactory. In Fieber's scheme for separating the genera of the *Jassidae* the element of the neuration of the elytra and wings is given a very prominent position, and I think justifiably so, notwithstanding the fact that it is subject to frequent and considerable variations.

In all the *Jassidae* the variation in the form of the genital pieces furnish very important characters for distinguishing the species, but in these descriptions I have made use only of such parts as can generally be seen without mutilating the specimen. In the male they are as follows: The *Plates* are two flat, or slightly convex, pieces placed on the ventral surface, with their inner edges in contact so that together they generally form a more or less regular triangle, which may be short and blunt, or long and narrow, with the sides either convex or concave; on the edge they are generally fringed with long hairs, and there is at times a submarginal row of stouter spines. On the base of the plates is a triangular, rounded, or short and transverse piece called the *Valve*; it varies much in shape, and the apex may be acute, obtuse, or emarginate. Beneath the plates viewed from below, are two long, more or less slender and curved pieces termed the *Styles*; they are rarely mentioned, as they are usually concealed from sight beneath the plates. Still farther

<sup>1</sup> these, and really forming the apical segment of the tergum,

are the Pygofer; they are placed on each side enclosing the anus, and are approximate above and below, and in these descriptions have, for the sake of convenience, been considered as one; as a rule, the aperture formed by them is somewhat oval, with the narrow end within on the ventral surface; here are attached the hooks or claspers, which are more or less slender, spine-like processes, curved inward and upward toward the anal style. Sometimes the pygofer are much elongated, and their surface, or at least their apical margin, is generally beset with stiff bristles. In both sexes, but particularly in the females, the form of the hind edge of the last ventral segment is very various in the different species, and is a specific character of primary importance. The sexual characters of the female, aside from the form of this ultimate ventral segment, are of a simple kind, and of but little comparative importance. The pygofer, which constitute most of the visible portion of the genitalia, present slight variations in form, but are of little value in determining the species.

For drawing up these descriptions I have used a compound microscope with an inch and one-half objective, but the more important characters could probably be made out with a good Codrington lense magnifying about fifteen to twenty diameters.

The locality from which this material was derived may be stated as Southern California. Most of it was obtained, Mr. Coquillett informs me, from the vicinity of Los Angeles, only a little from as far north as Newhall, about thirty miles. The numbers appended to the descriptions are those of Mr. Coquillett's collection.

## BYTHOSCOPIDÆ.

### 1. *Pediopsis nubila* n. sp. *Bythoscopus nubilus* Uhl. ms.

Form of *P. punctifrons*, but larger. Head obtusely angled before, pronotum coarsely punctured, without oblique rugæ. Elytra almost coriaceous, coarsely punctured, with numerous irregular transverse nervures almost obliterating the ordinary venation. Pale grayish brown; elytra whitish, clouded with brown. Length 3.5—4 mm.

Head broader than the pronotum, rather obtusely angled. Face coarsely punctured above, more minutely so below; apex of the front broad, angles rounded; clypeus broad, the sides parallel, apex rounded and a little depressed beyond the loræ, furnished with a few short stiff hairs on the margin; loræ broad, transverse, almost angled outwardly. Rostrum long, reaching the apex of the intermediate trochanters. Pronotum rather long, posterior margin less deeply arcuated than in our other species: latero-posterior margins reaching the eyes; surface coarsely punctured, punctures not obviously arranged in oblique lines; a more or less distinct impunctured central line. Scutellum, excepting the basal angles and the calloused margin each side of the apex, coarsely punctured. Superior surface of the propleura hidden

beneath the eye. Elytra broad; costa strongly convex; clavus and corium, the apex excepted, thick and coriaceous, coarsely punctured; nervures strong, somewhat irregular, connected, especially toward the apex, by numerous irregular transverse nervures. Ultimate ventral segment broad and short, almost pentagonal in outline, the short, abrupt apex with a shallow triangular notch; disc depressed, with a central impressed line. Pygofers broad, oblong, with a short, bluntly conical apex; surface covered with short, scattering hairs.

Color: Head, pronotum and scutellum grayish yellow, punctured with pale brown; apex of the face and central pronotal line whitish. Eyes brown. Legs and all beneath soiled yellowish white; a few obscure markings on the femora above and an annulus near the base of the tibiae, on the anterior and intermediate feet, obscure brown; posterior tibiae with black points at the base of the spines. Elytra obscure brown, pale and subhyaline toward the apex, with two indistinct, whitish, oblique bands, the basal extending from near the tip of the scutellum to the middle of the costal margin; the second is more obscure, or almost obsolete, and extends from the middle to the apex of the claval suture obliquely to the apex of the costa; basal punctures brown, nervures toward the apex whitish. Wings whitish, nervures pale brown.

Described from two female examples (N. 226). Very distinct from its American congeners, and easily distinguished by the thick coriaceous, ramosely veined elytra, and short ventral plate. In these characters it appears to be quite unique, at least I know of no exotic form exhibiting peculiarities analogous to these.

## 2. *Agallia oculata* n. sp.

Form of *A. 4-punctata* Prov., to which it is closely allied. Fulvous brown; elytra dark brown, with pale nervures; two large spots on the disc of the pronotum, and several smaller ones along the anterior margin and on the face, black. Length 4 mm.

Vertex much shorter at the middle than next the eye. Front broad, sides nearly straight above, rounded below to the base of the clypeus. Clypeus narrow, oblong, slightly contracted at the base, the apex subtriangular. Loræ narrow. Cheeks narrow, outer edge obtusely angled near the middle, below coalescing with the outer edge of the loræ. Pronotum somewhat pentagonal in form, or lozenge-shaped, with the posterior angle truncated before the scutellum; anterior angle rounded, the disc before somewhat tumid; latero-posterior margin feebly rounded, reaching the eye before, posterior angles rounded; surface transversely wrinkled. Scutellum small, the anterior field largely covered by the pronotum. Elytra longer than in the eastern *4-punctata*. Last ventral segment of the female long, about equalling the two preceding; hind edge feebly and regularly arcuated; disc with a narrow, depressed, longitudinal line on the middle. In the male this segment does not differ from the penultimate.

(To be continued.)

## Description of *Eterusia urania* n. sp.

BY WILLIAM SCHAUS, JR.

Primaries above olivaceous brown. A narrow yellow band crosses the wing from the middle of the costal margin, and does not quite touch the inner margin at three-fourths of the distance from the base. This band is bordered on either side by a series of velvety black spots, interrupted by the veins, which are tinged with deep metallic blue wherever separating the black spots, and lilacine where crossing the yellow transverse band. Secondaries above velvety black. Between the median vein and the abdominal margin two-thirds of the wing from the base deep metallic blue; on the apical half of the outer margin a row of blue spots longest at the apex. Primaries underneath black, the base largely metallic blue and green. A transverse yellow band from the costal to the inner margin, and a submarginal row of metallic spots. Secondaries underneath black, the abdominal margin broadly deep metallic blue, the base and costal margin shaded with green; an irregular transverse row of small chrome yellow spots from just beyond the middle of the costal margin to near the anal angle. Along the outer margin a row of light blue metallic spots. Antennæ, which are deeply pectinated at their extremities, dark blue. Frons dark green. Collar and thorax brown, tinged with green. Abdomen above dark metallic blue, underneath brown. Exp. 77 mm. 1 ♂.

Naga hills, Assam.

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The continuation of Mr. Leng's "Synopsis" is crowded out this month; better luck next time.

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One of the most notable features among the Lepidoptera frequenting the electric lights at Newark last summer was the very large number of a little Tineid, which, from specimens in the U. S. National Museum, I make to be *Laverna phragmitella*, an European species. The label on the specimens states that it is on *Typha*, of which there is an abundance near Newark. There is one other American specimen in the Museum from Fortress Monroe, Va.

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A revision of the *Toniocampinæ* is in press, and will appear at an early date in the Proc. U. S. National Museum.

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In speaking of *Raphiteles maculatus* (Ent. Am. v. 216) I quoted from a somewhat indefinite statement in Mr. Howard's letter determining the species for me. As the matter stands now it conveys the impression that the parasite had been heretofore bred *only* from *Scolytus rugulosus*. As a matter of fact it had been only so bred in the Department, but there are a number of other hosts known in Europe. *Pissodes strobi* is, however, really a new host, so the note has not lost point.

## SOCIETY NEWS.

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Meeting Dec. 3, 1889, at Brooklyn Institute, President Casey in the chair—23 persons present. The minutes of the November meeting were approved. The report of the librarian showed the donation to the library by Mr. A. W. P. Cramer of twenty-five books and pamphlets. Miss Elizabeth A. Wilkins, of No. 261 Henry Street, Brooklyn, associate member of the Institute, was elected a member of the Department.

Rev. J. L. Zabriskie read a paper entitled, "Note on some Case-bearing Lepidoptera feeding upon the seeds of *Juncus*," illustrated by enlarged diagrams showing the plants bearing seeds, with cross sections of the latter; also of the larvæ and protecting cases. Larvæ inhabiting three forms of cases had been taken. The larvæ had been found clinging to the seeds of *Juncus Greenii* Oakes & Tuckerman, and *Juncus tenuis* Willd. No imago had been obtained, but an identification of the species found upon the first-named plant by Mr. Hulst, showed it to be *Coleophora cispicella* Walsingham.

Mr. Smith gave a description of the mouth parts of *Stomoxys calcitrans* and *Hæmatobia serrata*, a recently imported species. An examination of the mouth parts in each species revealed no variation in either case thus proving them to be of the highest value as a means of classification and identification. He also stated that he had recently noticed in handling *Empretia stimulea* that the spines on parasitized larvæ had lost their urticating properties. Discussion on the nature of the urticating properties of several Lepidopterous larvæ was participated in by Messrs. Smith, Hulst and Weeks. No one had noted the fact stated by Mr. Smith, but it was general knowledge that the hairs of certain *Arctiidæ* retained their irritating properties even after removal from the caterpillar.

A. C. WEEKS,

*Recording Secretary.*

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In "Humboldt" for December, 1889, is an interesting statement of the amounts expended by the Prussian State Forestry Commission to control the ravages of forest insects only. In 1884-85 were spent 200,550 Marks; in 1885-86 were spent 171,404 Marks; in 1886-87 were spent 191,645 Marks. Of these sums the control of *Hylobius abietis* alone took from 107,200 to 109,300 marks. The sums are suggestive, and yet all of it was absolutely necessary for the prevention of serious damage. Even with these sums, and the trained officials to apply it the success in lessening the ravages was not satisfactory. It was not possible to do more than keep the pests in check. The destruction of the Cockchafer in the larval state is also still in the experimental stage, and the results are not satisfactory. The complaints in other parts of the empire of damage by white grubs are even greater than they are in Prussia, and some practical remedy would be a boon of inestimable value.

# ENTOMOLOGICA AMERICANA

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BROOKLYN, MARCH, 1890.

No. 3.

Proposed Corrections of Specific Names to Harmonize Mr. Henshaw's Catalogue of the North American Coleoptera, with the generally accepted European nomenclature, with relation to the species common to the two continents.

BY JOHN HAMILTON, M. D.,  
Allegheny, Pa.

The Roman type indicates the proposed name; Italics, the name now in Henshaw's Catalogue and Supplements (sometimes that in the European). Small Caps indicate a species represented only by a variety of the European form.

- |   |   |
|---|---|
| Dyschirius æneus <i>Dej.</i><br><i>frigidus</i> Mann.<br><i>integer, dentiger</i> Lec.        | P. IMPRESSUS <i>Panz.</i><br>var. <i>splendidulus</i> <i>Mots.</i>      |
| Clivina fossor <i>Linn.</i><br><i>collaris</i> † Lec.   | Bradycellus cognatus <i>Payk.</i>                                       |
| Bembidium littorale <i>Oliv.</i> (1791).<br><i>paludosum</i> † Catalog.                       | Hydrovatus pustulatus <i>Mels.</i><br><i>cuspidatus</i> † Catalog.      |
| B. ustulatum <i>Linn.</i><br><i>rupestre</i> † Catalog.                                       | Cœlambus inæqualis <i>Fab.</i><br><i>punctatus</i> <i>Say.</i>          |
| B. grapei <i>Gyll.</i>  | Deronectes brevis <i>Sturm.</i><br><i>depressus</i> † Catalog.          |
| B. flammulatum <i>Clairv.</i><br><i>undulatum</i> <i>Sturm.</i>                               | Hydroporus SANMARKI <i>Sahlb.</i><br>var. <i>rivalis</i> <i>Gyll.</i>   |
| Amara apricaria <i>Payk.</i>  | Agabus congener <i>Thunb.</i><br><i>ambiguus</i> <i>Say.</i>            |
| A. erratica <i>Duft.</i>  | A. dissimilis <i>Sahlb.</i>   |
| Platynus obscurus <i>Herbst.</i><br><i>oblongus</i> <i>Fab.</i> , <i>pusillus</i> <i>Lec.</i> | A. confinis <i>Gyll.</i><br><i>ovoides</i> <i>Lec.</i>                  |
| P. bogemanni <i>Gyll.</i><br><i>obsoletus</i> <i>Say.</i>                                     | A. erichsoni <i>Gem.</i> and <i>H.</i><br><i>nigrocæneus</i> <i>Er.</i> |

- Rhantus suturalis* Lac.  
*notatus* Fab.  
*Colymbetes dolobratu*s Payk.  
 var. *grœnlandicus* Aube.  
*Graphoderes cinereus* Linn.  
*fasciatocollis* Harris.  
*Helophorus granularis* Linn.  
*Cercyon nigriceps* Marsh.  
*centrimaculatum* Sturm.  
*Pteroloma forstrœmii* Gyll.  
*Bryaxis sanguinea* Linn.  
*Homalota sordida* Marsh.  
*lividipennis* Mann.  
*H. graminicola* Grav.  
*granulata* Mann.  
*Tachyusa pygmœa* Sachse, not Am.  
*Aleochara nitida* Grav.  
 var. *verna* Say.  
*anthomyiæ* Sprague.  
*Placusa tachyporoides* Watl.  
*? despecta* Er.  
*Gyrophœna affinis* Sahlb.  
*Gymnusa brevicollis* Payk.  
*Myllœna dubia* Grav.  
*Acylophorus glaberrimus* Hbst.  
*Quedius fulvicollis* Steph.  
*hyperboreus* Er.  
*Creophilus MAXILLOSUS* Linn.  
 var. *villosus* Grav.  
*Philonthus perforatus* Fauv., Horn.  
*atratus* † Horn.  
*P. picipennis* Maek.  
*Stenus montivagus* Er.  
*pterobrachys* G. and H.  
*brevipennis* Maek.  
*S. nanus* Stephens.  
*pusio* Casey.  
*S. pumilio* Er.  
*atomarius* Casey.  
*S. humilis* Er.  
*mammops* Casey.  
*S. canaliculatus* Gyll.  
*congener* Maek.  
*S. argus* Grav.  
*ageus* Casey.  
*S. morio* Grav.  
*subgriseus, indistinctus* Casey.  
*S. tarsalis* Ljung.  
*reconditus* Casey.
- Lathrobium quadratum* Payk.  
*nigrum* Lec.  
 var. *terminatum* Grav.  
*punctulatum* Lec.  
*Tachinus basalis* Er.  
*circumcinctus* Maek.  
*T. apterus* Maek.  
*Tachyporus nitidulus* Fab.  
*brunneus* Fab.  
*Conosoma bipustulatum* Grav.  
*bisignatum* Horn.  
*Bolitobius pygmœus* Fab.  
*3-maculatus* Say, *venustus* Mels.  
*B. angularis* Sachse.  
*pygmœus* † Horn.  
*B. exoletus* Er.  
*3-notatus* † Cat. *facilis* Casey.  
*B. pœcilus* Mann.  
*Olisthærus substriatus* Payk.  
*Oxytelus laqueatus* Marsh.  
*fuscipennis* Mann.  
*O. rugosus* Fab.  
*O. nitidulus* Grav.  
*punctatus* Lec., *? nitidulus* Lec.  
*O. tetracarinatus* Block.  
*depressus* Grav.  
*Trogophlœus pusillus* Grav.  
*subtilis* † Lec.  
*T. corticinus* Grav.  
*fulvipennis* Fauv.  
*T. memnonius* Er.  
*mancus, spectatus* Casey.\*  
*Geodromicus plagiatus* Fab.  
*ovipennis* Lec.  
 var. *nigrita* Muell.  
*Orochares angustata* Er.  
*Olophrum fuscum* Grav.  
*latum* Maek.  
*Homalium florale* Payk.  
*rufipes* † Fauv.  
*Adonia variegata* Goeze.  
*constellata* Laich.  
*Coccinella transversoguttata* Fald.  
*C. II-PUNCTATA* Linn.  
 var. *menetriesi* Muls.  
*Anatis ocellata* Linn.  
*15-punctata* Oliv.  
*Rhyssodes americanus* Lapl.  
*exaratus* † Ill., Westw.

Silvanus gemellatus *Duv.*  
*quadricollis* † Casey, Lec.  
 S. cassiæ *Reiche.*  
*gilæ* Casey.  
 Nausibius clavicornis *Kug.*  
*dentatus* Marsh.  
 Cryptophagus lapponicus *Gyll.,*  
*verus* (nec. Reitter, nec. *pubes-*  
*cens* Sturm).  
*beringensis* J. Sahlb.  
 Anthrenus verbasci *Linn.*  
*varius* Fab.  
 A. museum *Linn.*  
 A. fuscus *Latr.*  
*claviger* Er.  
 Orphilus niger *Rossi, not American*  
 Epuræa terminalis *Mann.*  
*immunda* Er.  
 Ips 4-guttatus *Fab.*  
 var. fasciatus *Oliv.*  
 Lathridius consimilis *Mann.*  
*parallelcollis* Mann.  
 E. constrictus *Gyll.*  
*carinatus* Gyll.  
 Corticaria pubescens *Gyll.*  
*piligera* Mann., *grossa* Lec.  
 C. ferruginea *Gyll.*  
*fenestralis* Auct., *deleta* Mann.  
 C. elongata *Gyll.*  
 Melanophthalma distinguenda *Com.*  
*morsa, pumila* Lec.  
*subangulata* Mots.  
 M. similata *Gyll.*  
*subimpressa* Zimm.  
 Cryptohypnus dermestoides *Herbst.*  
 var. 4-guttatus *Lapl.*  
 Melanotus castanipes *Payk.*  
 ♀ *scrobicollis* Lec.  
 Athous undulatus *DeG.*  
 Corymbites sericeus *Gebler.*  
 C. nigricornis *Panz.*  
*metallicus* Payk  
 Melanophila acuminata *DeG.*  
*appendicula* Fab., *longipes* Say.  
 M. GUTTULATA *Gebler.*  
 var. drummondi *Kirby.*  
 Opilus domesticus *Sturm.*  
 Necrobia rufipes *DeG.*

Gibbium psyloides *Czenpinsk.*  
*scotias* Scop.  
 Trigonogenius (Sphæricus) gibboi-  
 des *Boield.*  
 Xestobium rufovillosum *DeG.*  
*tessellatum* Fab.  
 Aphodius aleutus *Esch.*  
*ursinus* Mots.  
 A. putridus *Herbst.*  
*fetidus* Fab.  
 Oxyomus sylvestris *Scop.*  
*porcatus* Fab.  
 Phymatodes variabilis *Linn.*  
 P. lividus *Rossi.*  
*thoracicus* Comolli.  
 Rhagium INQUISITOR *Linn.*  
 var. lineatum *Oliv.*  
 Adoxus obscurus *Linn.*  
*vitis* Fab.  
 Entomoscelis adonidis *Pallas.*  
 Plagioderma armoraciæ *Linn.*  
*cochleariæ* Panz.  
 Bruchus chinensis *Linn.*  
*scutellaris* Fab.  
 B. pisorum *Linn.*  
*pisi* Linn.  
 B. rufimanus *Bohm.* should be  
 dropped.  
 Blaps similis *Latr.*  
*mortisaga* in error.  
 B. mucronata *Latr.*  
 Alphitobius ovatus *Herbst.*  
*diaperinus* Muls.  
 A. piceus *Oliv.*  
*mauritanicus* Fab. *diaperinus*  
 Panzer.  
 Alphitophagus bifasciatus *Say.*  
*quadripustulatus* Stephens.  
 Xylita lævigata *Hellen.*  
 Hypulus vaudoueri *Muls.*  
*fuscus* Lec.  
 Anthicus basilaris *Say.*  
*quisquilius* Thoms.  
 Otiorhynchus linearis *Linn.*  
*picipes* Fab.  
 Sitones lineellus *Bonsd.*  
 Hypomolyx piceus *GeG.*  
*pineti* Fab.  
 Tanysphyrus lemniæ *Payk.*

*Acalyptus carpini* Fab.  
*Ceutorhynchus cyanipennis* Germ.  
*Ill.*  
*sulcicollis* Gyll.  
*Rhinoncus pyrhopus* Bohm.  
*Phytobius velatus* † Lec. = n. s.  
*Xyloterus lineatus* Oliv.  
*bivittatus* Kirby.

*Dryocetes autographus* Ratz.  
*septentrionis* Mann.  
*Crypturgus pusillus* Gyll.  
*atomus* Lec.  
*Hylurgops glabratus* Zett.  
*pinifex* Fitch.

The following synonymy is proposed for consideration:

*Rhantus GRAPEI* Gyll.  
 var. *sinuatus* Lec.  
*Chalcophora MARIANNA* Linn.  
 var. *virginiensis* Herbst.  
 var. *angulicollis* Lec.  
*Tragosoma DEPSARIUM* Linn.  
 var. *harrisii* Lec.  
*Asemum STRIATUM* Linn.  
 var. *mœstum* Hald.

*Criocephalus RUSTICUS* Linn.  
 var. *agrestis* Kirby.  
*Monohammus SUTOR* Linn.  
 var. *scutellatus* Say.  
*Gastroidea viridula* DeG.  
*formosa* Say.  
*Pytho DEPRESSUS* Linn.  
 var. *americanus* Kirby.

Species, the European synonymy of which appears to be chaotic, and which it is prudent to retain in our catalogues with the present names till the matter is settled. Italics indicate the unsettled names as they relate to our fauna:

*Licinus silphoides* Fab. = *punctulatus* Fab. [unnecessary.]  
*Pristonychus terricola* Hbst.; whether this or *inæqualis* Panz. is the older is unsettled.  
*Bradycellus cognatus* Payk. = *deutschii* Sahlb.  
*Hydroporus morio* Sharp = *morio* Gem. and H. [some confusion.]  
*Rhantus bistriatus* Beigst = *suturellis* Harris [some confusion.]  
*Cercyon flavipes* Fab. = var. of *hæmorrhoidale* Fab.  
*Orphilus glabratus* Fab. = *niger* Rossi.  
*Nitidula bipustulata* Linn. = *bipunctata* Linn. [unnecessary.]  
*Corymbites tessellatus* Linn. = *sjælandicus* Mull. [distinct species.]  
*Bruchus obsoletus* Say = *obtectus* Say [equal in point of time, and *obsoletus* takes the precedence by long use.]  
*Otiiorhynchus maurus* Gyll. = *dubius* Stroem.  
*O. monticola* Germ. = *arcticus* Fab.  
*Sciaphilus muricatus* Fab. = *asperatus* Bonsd.  
*Lepyrus colon* Fab. = *palustris* Scop.  
*Hylastes trifolii* Mull. = *obscurus* Marsh.

Last summer I took *Ceutorhynchus erysimi* Fab., at Pocatello in southern Idaho. This species has been recorded from Kansas (Knaus, Trans. Kan. Acad. of Sciences, vol. ix, p. 60) and also occurs in Iowa. How widely it may have been distributed over the East I do not know.

H. F. WICKHAM.

## New Species of Mexican Lepidoptera.

BY WILLIAM SCHAUS, JR.

(Continued from p. 20, vol. vi.)

### MELAMERIDÆ.

**Flavinia jalapæ** n. sp.—Above primaries black, with a large round spot of bright yellow near the apex, and a semiovate yellow space on the inner margin from the base to near the internal angle. Secondaries bright yellow, the outer margin bordered with black. Underneath the markings the same as on the upperside, the apices of the primaries, however, faintly tipped with white. Head and antennæ black. Collar yellow. Abdomen black dorsally, yellow laterally and underneath. Expands 35 mm.; 2 ♂♂ 1 ♀.

Jalapa.

### LASIOCAMPIDÆ.

**Cœculia fibra** n. sp.—Male—Primaries above: basal half whitish, except a small space at the base and two contiguous transverse lines close to this small space, which are gray; outer half gray, paler along the outer margin, and separated from the inner whitish portion of the wing by two contiguous dark gray, transverse lines. Secondaries grayish white, with indistinct central and submarginal transverse grayish markings. The abdominal margin clothed with long grayish scales. Underneath dull white, with a broad dark transverse band on the primaries. Head and thorax brownish, mixed with yellowish scales. Abdomen subdorsally grayish, laterally and underneath yellow. Expands 35 mm.

Female.—Above dark gray, with two contiguous transverse lines at the base of the primaries of a darker shade, and two similar lines crossing the same wing just beyond the cell. A submarginal, transverse, wavy band of a slightly darker shade than the ground color. Underneath uniform dull gray. Head and thorax gray. Antennæ ochreous. Abdomen above gray, with transverse rows of dark yellowish scales; underneath deep yellow. Expands 52 mm.; 2 ♂♂ 2 ♀♀.

Coatepec.

**Hydrias deformis** n. sp.—Primaries above brown, a conspicuous round black spot in the cell, and a row of small black spots along the outer margin, most conspicuous at the internal angle, and gradually diminishing towards the apex. Secondaries brown, darkest in the centre and along the abdominal margin; a couple of small black spots near the apex. Underneath uniform light brown. Head, thorax and abdomen above, dark brown; underneath paler. Expands 36 mm.; 1 ♀.

Paso de San Juan.

**Ocha macerra** n. sp.—Primaries above white, at the base a small, and at the apex a large blotch of rich brown. Secondaries yellowish, white at the base; a small, rich brown spot at the apex. Underneath whitish, the costal margin of the primaries broadly bordered with brown. Head and thorax white. Abdomen golden yellow, except a dorsal tuft of white hairs at the base. Expands 20 mm.; 2 ♂♂.

Paso de San Juan.

LIMACODIDÆ.

**Echedorus infernalis** n. sp.—Primaries dull grayish black, crossed by numerous transverse angular markings of black and brown-gray. A small black spot at the end of the cell. Secondaries dull black. Underneath dull black, with a light, marginal, wavy band on the primaries. Collar and thorax black, base of patagiæ pink-brown. Abdomen dull black dorsally; underneath mixed with a few paler scales. Expands 38 mm. 1 ♂.

Jalapa.

BOMBYCIDÆ.

**Dicranura platea** n. sp.—Primaries silvery white, crossed by six wavy black lines from the costa to the inner margin; the first close to the base, the second interrupted in the cell by a circular black spot, beneath which the transverse line is double, the third crossing about the centre of the wing, the fourth crossing at the end of the cell, and between this line and the third there is another smaller black circle in the cell; the fifth and sixth lines rather heavier than the others, the sixth having at the apex a shorter black line contiguous to it. On the extreme outer margin a row of conspicuous black spots. Secondaries grayish, with indistinct marginal and submarginal lines, and a row of small black spots on the extreme outer margin. Underneath brown-white, fringes white; a row of black spots on the extreme outer margin of both wings; a few black marks on the costal margin of the primaries, and two indistinct transverse bands on the outer portion of the wings. Head and collar white; thorax anteriorly streaked with black, and otherwise spotted with black. Abdomen silvery gray, with transverse black lines, anus velvety black. Expands 42 mm., 1 ♀.

Jalapa.

DREPANULIDÆ.

**Perophora inscita** n. sp.—Wings above fawn color, thinly powdered with black scales. The costal margin of the primaries at the apex, and the outer margins and fringes of both wings olive-brown. An olive-brown line crosses both wings from just below the apex of the primaries to the anal angle of the secondaries; this line is faintly bordered outwardly with yellowish. On the costal margin of the primaries about two-thirds from the base a small cluster of black scales. A very small crescent-shaped transparent spot at the end of the cell on the primaries, and a small black spot on the cell of the secondaries. Underneath paler, with the markings of the upperside repeated, but the transverse band is very indistinct on the secondaries, and at its upper extremity on the primaries it turns abruptly inwards to the costal margin, forming an acute angle. Head, thorax and abdomen fawn color speckled with black. Expands 33 mm.; 1 ♂.

Coatepec.

HEPIALIDÆ.

**Phassus basirei** n. sp.—Primaries pale fawn color, thickly mottled with gray streaks and light brown. Several dark brown spots and black streaks along the costal margin, and along the outer margin a series of *u*-shaped

marks of a deep brown. Near the base of the wing and starting from the subcostal vein, a very irregular wavy brown band strongly outlined with black; at first this band is moderately wide, then narrows, beyond it suddenly bulges to treble its original width, and rapidly tapers to a fine black line on the inner margin near the base. A dark brown space at the end of the cell, inwardly outlined with black and enclosing at its outer extremity a triangular silver spot. Secondaries dull brown, faintly spotted on the costal margin; the fringe is spotted with light brown at the end of the nervules. Underneath dull brown, with light spots on the costa of both wings. Exp. 150 mm.; 2 ♀♀.

Coatepec.

### NOTODONTIDÆ.

*Anodonta fascis* n. sp.—Primaries above fawn color, mottled longitudinally with different shades of brown, the costal margin towards the apex and the inner margin being narrowly streaked with black and reddish brown. The outer margin consists of first a pale brown streak, then reddish brown, bordered outwardly by a fine, irregular black line, afterwards light brown, and the base of the fringe blackish. All these markings form together but a narrow border to the outer margin. At the end of the cell three whitish transverse streaks unite in forming a noticeable spot, and beyond this to the border of the outer margin the wing is very pale fawn color. Secondaries dull brown, with the outer margin reddish brown, preceded at the anal angle by a blackish shade. The extreme outer margin marked with two fine brown lines; the fringe towards apex light, towards anal angle dark. Underneath light brown, a black streak on extreme outer margins. Head and thorax dark fawn color. Abdomen above dark brown, underneath light brown. Exp. 85 mm.; 2 ♂♂.

Jalapa.

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### A Contribution to Hymenopterological Literature.

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At the February, 1889, meeting of the Entomological Society of Washington, there occurred an animated discussion on the habits of *Bombus* and *Apathus*, especially with reference to the economy of *Apathus*, the majority of the members holding the received view that these bees are inquilines. At the close of the discussion the following corruscation was presented by the poetical member, which, at the time, was well received on account of its aptness to the discussion rather on account of its rhythmical merit. It may be necessary to state that Continental pronunciation is given to the diphthong "æ".

Oh! an *Apathus* sat on a *Chrysanthemum*  
 A-cleaning her antennæ,  
 And she little thought of the *Pyrethrum*  
 That would take her life away!

And, there she sat, a-taking a rest,  
And smiled in a satisfied way,  
For she'd laid ten eggs in a Bombus nest  
And there'd soon be the de'il to pay.

For her offspring dear, her very first brood,  
Would hatch in a very short time,  
And no trouble she'd have a storing up food,  
For she worked on the Cuckoo line.

Her young would hatch ere the young bumble-bees,  
And the young bumble-bees would die,  
While the young Apathi would live at their ease  
And fatten like pigs in a sty!

So she sat in the sun, this wicked old bee,  
And scratched her tibixæ,  
And chuckled inside in lazy glee  
At the business she'd done that day.

\* \* \*

But the Chrysanthemum on which she sat  
Belonged to a neat old maid,  
Whose plants were her pride (next to her cat),  
And that day she was out on a raid

Against Aphids and slugs, with a Buhach-gun  
Filled with Peters & Milco's best,  
And seeing the Apathus, just for fun,  
She dusted her yellow vest.

Lórd! how the cheat kicked as she fell on the ground!  
And how she did buzz and hum!  
But she never got well—she never "came round"—  
Her fraudulent life was done.

\* \* \*

From this little tale can a moral be drawn—  
How the bumble-bee loafs not a bit;  
But works all day from the earliest dawn,  
And thus 'scaped the death-dealing hit?

This moral is good, but please don't forget  
Those eggs that the Apathus hid!  
The Bombus is working and slaving yet,  
But it's all for the other one's kid!

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Dr. Horn has been appointed Professor of Entomology at the University of Pennsylvania. The Doctor could do us no greater favor than by graduating many young men to follow in the lines he has so well staked out!

## NEW CALIFORNIA HOMOPTERA.

BY E. P. VANDUZEE.

(Continued from p. 38, vol. vi.)

### *Agallia oculata*.—Continued.

Color: Superior edge of the vertex and the broad outer margin of the cheeks whitish; loræ, clypeus and disc of the front pale fulvous. Sutures of the face, central longitudinal line on the vertex, two round spots on the ocelli, two larger ones above these on the superior margin, three small ones adjoining each eye, antennal cavities, and a few transverse lines on each side of the front, black. Eyes dark brown. Basal joints of the antennæ whitish. Central longitudinal line of the pronotum, two large oval or subtriangular spots placed obliquely on the disc either side of this medial line, two minute ones near the apex, and a small one on the posterior margin behind each eye, black; anterior margin and an area behind each of the large discal spots obscured with brown. Scutellum pale, the basal angles, two small points between them, the short transverse impressed line, and a longitudinal line dividing the posterior field, black. Elytra dark brown, paler toward the costa, the nervures whitish. Pectus black. Coxæ and legs pale; lower surface of the anterior and intermediate femora and all the tibiæ, especially the posterior, clouded with fuscous; claws black. Abdomen testaceous brown, or almost fuscous, sometimes darker on the disc of the tergum and venter; genital pieces pale.

Described from two individuals, representing both sexes (No. 278). The dark markings are without doubt subject to more or less variation in intensity and extent as in our allied eastern form, *A. 4-punctata*, which this represents in the Californian fauna. The male is paler in color than the female, thus bringing the dark spots into stronger contrast.

## JASSIDÆ.

### 3. *Jassus lactipennis* n. sp.

Form oval, short and thick. Color soiled white or yellowish. Elytra milky, or subpalescent white, nervures simple, strong; tergum black. Length about 4 mm.

Head a little narrower than the pronotum, prominent before. Vertex pentagonal in form, obtusely angled before, hind margin slightly concave, length next the eye subequal to the breadth; passage to the front rounded; front narrow, convex, the sides parallel. Clypeus oblong, about one-half the width of the front, truncate at the ends. Loræ small, extending from the lower angles of the front to a little beyond the middle of the clypeus. Cheeks narrow, sides concavely arcuated from the outer angles of the eyes to the loræ, then rounded to the apex, which in the male distinctly surpasses the clypeus. Eyes, viewed from the side, almost round, from above oval. Ocelli minute, on the edge of the vertex quite distant from the eyes. Antenna very long, basal joints stout, base of the seta thick, but tapering rapidly to a slender bristle. Rostrum short, hardly reaching the tip of the anterior trochan-

ters, composed of two joints, the second a little the longer; pronotum short, especially in the male, hardly more than half the length of the vertex; angles prominent, posterior margin concave, subparallel to the anterior; surface obscurely transversely striated. Scutellum longer than the pronotum. Elytra narrowed toward the tip; costa uniformly arcuated from near the base to the apex; appendix very narrow; nervures prominent, punctured, first sector forked once at the basal third, where a transverse nervure unites it with the simple second sector, thus forming one small basal, two long discal, and four short apical areolets; costal areole broad. Clavus with two nervures, the inner short and curved inwards to the suture, but little behind the point of the scutellum; first two sectors of the wings united in one before their end; third sector forked on its apical fourth and united to the second by an oblique nervure; supernumerary cell present. Legs normal; basal joint of the posterior tarsi exceeding in length the two following.

Color: Male.—Head pale dull fulvous yellow, clearer on the central line of the vertex and near the ocelli; extreme tip with a small black point and another adjoins each ocellus without; front with a brown longitudinal vitta each side. Eyes black, pronotum dusky whitish, with three paler longitudinal lines, the lateral somewhat oblique. Scutellum pale yellowish white, with a short, oblique, brown line near each basal angle in continuation of the inner claval nervure. Elytra subhyaline, dull subopalescent or milky-white; nervures brown, dotted with white, paler at apex. Wings whitish hyaline, iridescent; nervures brown and conspicuous. Beneath black, pectoral pieces edged without with pale. Abdomen black, connexivum and edge of the segments pale; apex of the genital pieces whitish. Legs soiled white, apex of the tarsal joints and lower face of the posterior tibiae embrowned.

Female.—Head, pronotum and scutellum dull white, tinged with yellow; frontal vittae pale salmon color, or sometimes wanting. Tergum and all beneath soiled white; base of the tergum, and occasionally a few spots on the sternum, black; first two sectors of the wings pale and indistinct, otherwise like the male.

Genital pieces: Male.—Valve wanting, plates long, narrowed above to the obtusely rounded tips; with a few scattering hairs.

Female.—Last ventral segment longer than wide; apex straight, with a minute central notch. Pygofer broad, not produced at the apex; a little shorter than the ovipositor, fringed with a few short hairs.

Described from one male (No. 629) and two female (No. 277) specimens. Superficially, this insect bears a marked resemblance to *Tettigonia tripunctata* Fitch, although the two species are very distinct structurally. It differs from the genus *Jassus* as restricted by Stal in the simple neuration of the elytra and the consequent less number of apical areoles, the convex front, the narrower clypeus, and the elongated antennal setae, and probably forms the type of a distinct genus. It has much the form of *Jassus graciosus* Span. as figured by its author (Of. K. Vet. Ak. Forh. Vol. 36, No. 6, p. 25, plate 16, fig. 10, 1879), but is shorter and differs by most of the

characters given above as separating it from Stal's genus. It is certainly a very interesting addition to the Jassid fauna of N. America. The opalescence of the elytra is much more manifest in some examples than in others, but otherwise there seems to be but little tendency to variability in the species.

#### 4. *Scaphoideus scalaris* n. sp.

Smaller and less robust than *S. immistus* Say, which it approaches in ornamentation. Pale testaceous, varied with brown; elytra whitish hyaline, with brown nervures and areolar spots. Length about 5 mm.

Head narrower than the pronotum, forming an almost regular equilateral triangle, the posterior margin deeply arcuated, vertex horizontal, apex obtuse, passage to the front rounded. Front long and narrow, sides nearly rectilinear, a little incurved at the apex. Clypeus narrow, widened at the rounded apex, which moderately surpasses the cheeks. Loræ as wide as the clypeus. Cheeks broad, feebly angled opposite the middle of the loræ, with which they coalesce before reaching the clypeus. Antennæ about as in *immistus*. Hind margin of the pronotum straight, latero-posterior margins more oblique than in the allied species, and the lateral angles more prominent.

Color pale testaceous. Vertex with a transverse brown spot anterior to the middle, behind which a broad whitish shade runs to the hind margin, bisected longitudinally by a fine brown line and obscurely margined with the same color; posterior to this brown mark is a similar, but slightly oblique one on either side of the central whitish line, extending outwardly from its margin nearly to the anterior angle of the eye; anterior margin of the vertex with an angulated brown line, beyond which on the extreme edge are five whitish spots, three on the apex and one adjoining each ocellus, or these may be reduced to a single arcuated spot each side of the apex. Temples alternated with brown and white. Face pale testaceous, embrowned beneath the eyes, front brown, with the central and lateral transverse lines and the margin pale, or pale, with transverse brown lines more or less confluent above. Base of the antennæ pale, second joint with a brown ring, setæ brown, paler at base. Rostrum pale, tip black; pronotum alternated with brown and cinereous on the anterior margin; disc obscurely irrorate with pale, and with an indistinct pale central line. Scutellum obscurely varied with pale testaceous and cinereous, sometimes with brown spots on the basal angles. Elytra whitish hyaline, faintly obscured with pale fulvous in about three transverse clouds; nervures and the centre of some of the discal areoles on the corium pale brown; two short transverse nervures beyond the apex of the costal area, two others on the sutural margin beyond the tip of the clavus, and the broad apex fuscous, sutural margin of the clavus with three small fuscous spots, one on its extreme tip and another on the apex of each claval nervure. Wings hyaline, iridescent; nervures fuscous. Beneath pale testaceous, faintly embrowned on the middle of the pectoral pieces and on the sides of the ventral segments. Tergum fuscous, the incisures and margins pale. Legs soiled white, the lower surface of the femora obscurely clouded with pale brown; tip of the tibiæ, the tarsal joints, and a minute point at the base of the tibial spines on the posterior feet blackish.

Genital pieces: Male.—Last ventral segment broadly excavated on the posterior margin. Valve short, occupying the concavity of the hind margin of the last ventral segment; its posterior edge but feebly convex, with a minute central tooth. Plates flat, rather long-triangular, their edges almost straight, above abruptly narrowed to long, slender, flaccid tips, clothed at their apex with soft white hairs. Pygofer much longer than the plates, thickly beset with long, stout, brown bristles.

Female.—Penultimate ventral segment narrowed at the middle, the ultimate long, rounded toward the apex, which is truncated and compressed against the sides of the pygofer; surface finely punctured. Pygofer long and narrow, clothed with stiff bristles.

Described from six individuals representing both sexes (No. 605 male, No. 623 female). This neat little species is very closely allied to *S. consors* Uhl., but appears to be sufficiently distinct. It is quite variable in the shade of the ground color, and in the depth and extent of the dark markings, especially on the abdomen.

The genus *Scaphoideus* has been recently characterized by Mr. Uhler in the "Trans. of the Maryland Academy of Sciences for 1888, p. 33 (1889)," and by M. Provancher in his "Petit Faune Ent. du Canad. Vol. 3, p. 276." It agrees with *Thamnotettix* and *Phlepsius* in wanting the second short transverse nervure connecting the inner branch of the first sector with the second sector, and by this same character may be separated from *Platymetopius*, with which it seems to be nearly parallel. Its true position will doubtless be found between the two former genera which it serves in a measure to connect. It is distinguished from all other genera of the *Jassidæ* known to me by its elongated antennal setæ.

(To be continued.)

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### Regarding *Stenopodius flavidus*.

The remarks of Prof. Smith on this insect in Vol. V of ENT. AMER. p. 122, have reminded me of an observation I made while in Arizona which tends to disprove the correctness of Dr. Horn's surmise that the species is subaquatic in its habits. I captured two specimens of this remarkable insect on a low plant (one of the *Maltavacca* I believe) at least three miles from any water. Their presence in such a situation leads to the belief that they can hardly be subaquatic, as it is doubtful if two specimens would travel so far from water over such an exceedingly dry country and come to rest on the same plant. These two specimens were all I ever saw. Taken at Winslow, Ariz., in early July.

H. F. WICKHAM.

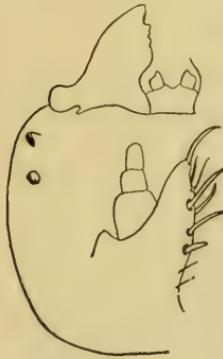
## NOTES ON SOME SCOLYTIDS.

BY JOHN B. SMITH.

During the early days of April I found opportunity to study several species of *Scolytidæ* still in their burrows. Some of these species have not yet been satisfactorily determined. To Mr. E. A. Schwarz I owe the identification of species here treated of.

### *Chramesus icoriæ* Lec.

Quite common in Hickory twigs from three-fifths to one inch in diameter. The burrows are mainly in the wood and just traced on the bark. The main channel made by the imago is clean, upright, usually about an inch in length, with an enlargement at one side, usually at the top, but quite frequently also at the bottom, enabling the parent beetle to turn in the burrow. The form shown in the annexed figure is characteristic and observable in all specimens.



From each side of this main gallery arise the larval galleries, which are always closely packed with the sawdust made by the larva. These galleries vary greatly in length; some, containing a fully grown larva, being scarcely a third of the length of others containing larvæ no whit larger. They start from the main gallery at right angles, but usually turn up or down almost immediately if at either extreme of the gallery, or as soon as they get

beyond the range of the preceding gallery. It is comparatively rare that there is a crossing of galleries; often there will be scarcely a shaving between them. Rarely a larva will get tired of mining across the grain, and will strike boldly upward or downward crossing whatever is in the way to get a free space. When the larva is fully grown the gallery is rather abruptly widened as a pupal chamber. At this date, April, none of the larva have transformed, but they have ceased feeding. The figure will show the appearance of the galleries. The larva is curculionid in form, pure white, about one-sixteenth of an inch in length, and with a brown, chitinous head, usually retracted so as to show only the mandibles. The form

of the head is indicated in the annexed figure. There are two ocelli on each side, very distinctly shown; the mandibles are very stout, curved, with a broad gouge-like cutting face, somewhat irregularly serrate or dentate, the opposing edges meeting accurately. The maxilla is broad, fleshy, furnished with a double series of stout, longer and shorter spines. The palpus is 3-jointed, the joints smooth, short and stout. The labial palpi are 2-jointed, the basal joint broad and flat, not visible, except on careful examination, the terminal joint obtuse; the other features are scarcely characteristic enough to describe, and the figure will give a good idea of the mouth parts.

### HYPOTHENEMUS Westw.

This genus deserves the careful study of a specialist, judging from my observations made on the biological side of the matter. From grape stems, infested by *Phymatodes amoenus*, I bred also a series of Scolytids making perfectly straight, longitudinal galleries, and occasionally boring a clean hole to the pith. Two-sized specimens differing in form and vestiture were found, which I accepted as male and female, and these Mr. Schwarz named as *H. dissimilis* for the more robust form, and *H. eruditus* (large form, *hispidulus* Lec.) for the slighter form. I was convinced we had here the two sexes of one species, but such occurrences in the Scolytids are not rare, i.e., where male and female are described as specifically distinct, and I thought nothing of it. All the galleries seemed made by the imagos and I saw no trace of larvæ.

Some few days later, in cutting oak branches, I ran across a lot of small twigs which had the centre hollowed out, and, rammed up at one end, a line of beetles varying in number from three to six; there were no larval galleries, and the infested twigs were only about double the diameter of the inclosed beetles. There were here also two sizes represented, and altogether they closely resembled the grape species. I sent them to Mr. Schwarz, and in due time received a return; the larger specimens, *H. dissimilis*; the smaller, *H. erectus*. These two forms in oak I am also convinced are sexes of one species, though what the exact relation of the *erectus* in oak to the *eruditus* (*hispidulus*) of the grape may be I will not venture to state. Unless polygamy exists among Scolytids I will not venture to guess why the males to both *eruditus* and *erectus* seemed to be *dissimilis*.

About the same time I found, with *Chramesus icoriæ*, in smaller branches of the same trees a small species making a somewhat dis-

tinctive gallery, a figure of which is also hereto annexed. In each case there is a very irregular main gallery, from which branch off in all directions and at very irregular intervals, short, irregular galleries. Usually there is, in about the centre of the system a loop, connecting two main series and giving origin to several larval galleries radiating in all directions. At the time I collected the twigs the beetles were quiescent in the side galleries. The galleries seemed uniform in diameter throughout, and were in the wood rather than the bark. At about the same time I found in the stems of oak cut for *Elaphidion* larva, a very similar species with galleries very much the same, but much more numerous and much less definite for that reason. Two sizes were represented here also, but all of them less than half the size of the grape or other oak species. These also I sent to Mr. Schwarz, and in due



time received the legend: "*H. eruditus* West. a little larger than typical form," and "*H. eruditus* West. typical size." Here my faith ends! I feel certain that *hispidulus* Lec. is not *eruditus* Westw., and I am as certain as any one can well be from field work merely, that *dissimilis* Zimm. and *hispidulus* Lec. do refer to sexes of the same form. Where *erectus* Lec. may go I am not so certain, but if it be distinct from *hispidulus*, then the male cannot be the *dissimilis* Zimm.

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### The "Ultimate Larva" of *Platypsyllus*.

BY GEO. H. HORN, M. D.

In the February ENTOMOLOGICA Dr. Riley describes what he calls the "ultimate larva" with so many details very greatly different from those previously described by him and myself in what, for convenience, I will call the "penultimate larva," that I have thought it advisable to direct attention to them.

It may be stated axiomatically that the larvæ of coleoptera, more particularly in their final period, develop toward the imago without any abrupt changes, which cause them to differ both from an earlier stage and from the imago.

The so-called "ultimate larva" violates the above proposition in many important particulars, but for present purposes the head is alone taken for review.

In the larva and imago of *Platypsyllus* the head is of semicircular outline, the broadest portion being the base. In the "ultimate

larva" the head is of triangular form with curved sides and rounded angles, broadest across the front.

In the larva and imago there is no trace of eyes or ocelli, while there are two ocelli on each side in the "ultimate larva."

No labrum, whatever, exists in the larva, and but a doubtful rudiment in the imago, while the "ultimate larva" has a rather large, well-developed labrum.

The mandibles of the larva are slender, lancet-like, while none exist in the imago; the "ultimate larva" has a bidentate and normal-looking mandible, according to the description and figure.

The antennæ in the larva are situated at or slightly under the hind angles of the head, in the imago very decidedly in the latter position, but in the "ultimate larva" they become frontal!

Although I have not seen Dr. Riley's specimen, I am satisfied (if his larva is a *Platypsyllus* at all) that figure "c," p. 28, represents the underside of the head and not the front, the antennæ slightly within the hind angles by the drying of the specimen, while the somewhat triangular area at the centre of the head is the limit of the buccal cavity, as may be inferred by an examination of previously published figures. I am equally certain that neither the so-called labrum nor mandibles can be demonstrated in the position in which he represents them, in any *Platypsyllus* larva in any stage.

It is highly probable that Dr. Riley's descriptions were made from a dried specimen requiring much manipulation for study, and that the real mouth parts, very soft at best, have become shrunken beyond recognition.

To me it is incomprehensible that an "ultimate larva" should present such radical differences from the larva from which it has developed and from the imago toward which it is developing.

In conclusion, I will ask a careful comparison of previous figures published by Dr. Riley and myself with that of the "ultimate larva" as given on p. 28. That there has been a grave blunder in one or the other is, I think, indisputable, and I feel very willing to leave the matter to the inference of students of insect morphology.

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The fearless and excellent young Lepidopterist, Mr. Doherty, who has been collecting for me for the past two years in Borneo, Malayan peninsula, Naga hills of Assam and surrounding countries, has added fresh laurels to his fame by constantly making new discoveries. Some of the types just described in the Entomological Society of Bengal adorn my collection. Many of his highly interesting letters read like the adventures of a Stanley, and I shall publish extracts from them from time to time. B. NEUMOEGEN.

## Description of the Larva of *Thymalus fulgidus* Er.

BY WM. BEUTENMUELLER.

*Color:* body above and below sordid white. Head light brown, mandibles and cervical shield piceous, as is also the anal process.

*Head* subglobose, shining, smooth; anterior portion somewhat narrower than the posterior. *Eyes* five on each side, minute. *Clypeus* transverse, much broader than long, sides somewhat oblique. *Labrum* about one-third the size of the clypeus, anterior margin rounded. *Mandibles* short, stout, apex obtusely bifid. *Antennæ* very short, 4-jointed, first and second joints thick, third joint shorter, last joint slender, more elongate, with a short process at the base.

*Maxillæ* elongated, lobe rounded at the apex, with a few bristles.

*Maxillary palpi* 3-jointed, not extending beyond the lobe, first and second joints same size, subglobose, third joint more slender. *Labium* quadrate, as broad as long. *Labial palpi* 3-jointed, all of about equal width, subcylindrical, first joint stout, second joint more slender, third joint rounded at the apex.

*Body* elongate, convex above, somewhat flattened beneath; posterior extremity with a short fork-like process with a few small tubercles. Thoracic feet short. The body, up to about the fourth segment, is of equal width, then becoming somewhat broader, last segment tapering; on the body above are three rows of depressed spots and two rows beneath.

*Length* about 6 mm. *Width* about 3 mm.

*Pupa* sordid white, subfusiform, body tapering to a blunt point at the posterior extremity, which is provided with two short tubercles. Each segment laterally is furnished with a short tubercle, and on the body above are three rows of small, elevated spots on each side. Thorax smooth, shining, anterior margin truncate, with the head bending downward. *Antennæ*, wing-cases and legs free.

*Length* 6 mm. *Width* 3 mm.

Lives in numbers in a large species of white fungus growing on trunks of prostrated white birch trees. The eggs are deposited late in fall and emerge the following spring. The larva becomes full grown in May. According to Chapuis et Candeze (Mem. Soc. Liege viii, p. 417, 1855) the larva of *Thymalus limbatus* of Europe, is found under the bark of wild plum apparently living exclusively upon the woody substance.

## A HINT TO COLLECTORS.

The present season promises to be an early one, and Lepidopterists, *especially*, should be on the lookout for the early moths. Many of our rarest species are extremely early flyers. The bombyciform *noctuidæ*, like *Feralia* and its close allies, fly in March and April. Wherever the electric lights are conveniently located it will pay to keep a close watch on them.

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In a little book by Fritz Rühl, "Der Köderfang der Europäischen Macrolepidopteren," I notice a dodge that was new to me, and may be to many of our readers. He says diurnals may be attracted in numbers if, in the vicinity of favorite resorts, some twigs and leaves convenient for the collector, be smeared with Limburger cheese! The butterflies are very fond of this, and may be easily approached and taken. The method is certainly worthy of trial. The early blossoms should not escape attention during the evening, and sugaring will pay. Mr. Rühl says that a few drops of sulphuric ether to the sugaring mixture adds greatly to its effect.

For the easy recognition of sugared trees when making the rounds, a piece of white paper stuck on a twig is suggested.

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Mr. Lugger writes us among other things: "I shall collect all the *Lachnosterna* I can by beating, as no electric lights are near by, and those in the city are a nuisance, being over 100 feet above the streets. I always thought that the invention of electric lights was simply and solely made in the interest of Entomology—not to enlighten entomologists, but to furnish him with specimens. Another illusion gone!"

Poor Mr. Lugger, we can understand his feelings! It has occurred to us, that we have seen at lights high in air, some desirable moths circling round without a chance to coax them within reach.

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Mr. William Schaus, Jr., the clever and enthusiastic young Lepidopterist, left London for Brazil, about three months ago, on an extended collecting tour for objects of natural history. As he is assisted by young Baron Rothschild, genius and money will undoubtedly contribute to make the interesting trip a perfect success.

B. NEUMOEGEN.

CRESSONIA HYPERBOLA n. var.

BY ANNIE TRUMBULL SLOSSON.

I give the above name to a very striking form of *C. juglandis* found by me last Spring in Florida. My one specimen is a female, much smaller than the usual form, and even a little smaller than any male in my collection. The coloration is very pale and uniform, somewhat like that of Mr. Strecker's *pallens*, but with a purplish tinge. But the distinctive peculiarity of this form lies in the course which the two median lines take. The upright basal line is as usual, except that it is somewhat diffuse; the next spoken of by writers in their descriptions of *juglandis* as "at basal third and more nearly perpendicular to costa" than the basal line, runs as usual until just below vein two (medio posterior), when it joins the third line. This third runs as in the ordinary form, from outer third of costa, curving obliquely inward, but grows abruptly more oblique and meeting the second line, the two form a loop, which lies on and below vein two. The lower part of the usual median lines is entirely wanting, as is also the dark shade between them, which, in the ordinary form, makes a patch upon inner margin. The outer line parallel with second median is present and distinct; the peculiar loop, open to costa and taking the place of the usual transverse median lines, gives the wing a striking and unfamiliar look, and suggests the varietal name I give to this form. The secondaries have but one transverse line, the usual inner one being absent. My specimen was taken at light in Green Cove Springs, on the St. John's River, Florida.

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SPECIAL NOTE.

In accordance with custom, numbers 1, 2 and 3 are sent to all our old subscribers; but no future numbers will be sent without subscription first received. We would respectfully urge our friends to remit promptly and to try and persuade others to subscribe. The greater the income the better the paper; we are not looking for dividends, but support, and we really ought to receive it at the hands of the entomological public.

To facilitate matters we would beg the attention of correspondents and exchanges to the notices on the second page of cover.

## SOCIETY NEWS.

Meeting Jan. 7, 1890.—Twenty-one persons present. Capt. T. L. Casey presiding. Reports of the Treasurer and Assistant Editor respectively, for the year ending Dec. 31, 1889, were read and accepted. Col. William C. Beecher, of 123 Columbia Heights, a member of the Institute, was elected a member of the Department. The election of officers was postponed until the first meeting in May, to correspond with the other departments of the Institute. The election of editor or editors was laid over until the February meeting. Mr. Roberts opened the scientific discussion by exhibiting specimens of *Deronectes Hydroporus* and *Dineutes* and pointed out differences of structure existing in individuals now associated under one species in each of these genera, which differences from their constancy seemed to indicate that they in fact belonged to distinct species. Mr. Hulst was appointed to read a paper at the next meeting. Mrs. A. T. Slosson presented to the Society ♂ and ♀ specimens of *Seirarctia echo*, which were accepted with thanks.

Meeting Feb. 4, 1890.—Thirty-four persons present. Capt. T. L. Casey, President, in the chair. Mr. Henry S. Woodman explained a method of preparation and mounting of entomological specimens for microscopic purposes. Pasteboard rings could be readily made by using two gun-wad punches differing in diameter of cut, say one-eighth of an inch, the outer edge being cut first. A glass slide was then placed upon a turn-table and the balsam applied in the usual manner, but always slightly larger than the cut on account of the shrinkage of the balsam in drying. No solicitation need be felt on account of air bubbles, which in time would disappear. The cut was laid in position by a pair of tweezers and then adjusted by a needle point applied to its inner edge, after which more balsam was added until it projected above the cut. The object to be examined was then deposited in the balsam and arranged under a lens, with the needle point, after which a cover-glass of smaller diameter than that of the cut was placed over the balsam, and the edges made to correspond by a short spatula-like steel blade, the cover-glass being then firmly pressed upon the cut, which completed the work. Prof. Smith added that by boiling the balsam on the glass over a flame, all air bubbles were immediately expelled, the balsam was hardened, and the slide could be used forthwith.

Dr. Zabriskie presented a double-sided case devised by himself for containing botanical specimens. The two sides being of equal size, joined by a hinge at the back. Two rows of cards of three each, upon which the specimens were glued, exactly filled each side, the upper edges of the upper row and the lower edges of the lower row being inserted in a groove running along the top and bottom of the cases, while the edges of the cards where they came in contact in the middle were prevented from displacement by a retaining bar, consisting of a flat narrow strip of wood, one end of which could be fitted in a cavity, in the side of the case, and the other fastened by passing over a small spring. The bar could be released by pressing back the spring, and cards rearranged if desired.

The cases contained twelve specimens of portions of the stems and leaves of *Rosa carolina* and *lucida*, affected by several species of Cynipidæ and exhibiting nearly all the effects produced by the several species of these insects upon the wild rose in this locality.

Mr. Meeske presented to the cabinet a cocoon and pupa of *Samia cynthia* filled with partially developed ichneumons, and a number of specimens of the perfect ichneumon.

A. C. WEEKS,

*Rec. Secretary.*

# ENTOMOLOGICA AMERICANA

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No. 4.

## NEW BEAUTIES FROM NEAR AND FAR.

BY B. NEUMOEGEN.

*Parnassius smintheus*, var. *nanus*.—Prominent entomologists of both hemispheres arrived at the conclusion years ago, that the *P. intermedius* Mén. and the *P. smintheus* Doubl.-Hew. of this country are one and the same insect. Typical specimens from western Siberia, which I possess, do not leave the least doubt as to this fact. The Parnassidæ of eastern Siberia, Ochotsk, Kamtschatka, migrated centuries ago across Behring Straits, settling from Alaska down the Rocky Mountain range as far as the borders of New Mexico.

*P. eversmanni*, which was first discovered at Kanska and Ochotsk, was obtained in moderate numbers at Nicolajewsk in the last few years, and is the same insect as the one found in Alaska, especially in the Yukon country. Even its female variations, named *P. wosnesenskii* by Ménetries, and *P. thor* by Hy. Edwards respectively, are synonyms, thus substantiating the migration theory. As the northern and southern climate of our "Rockies" vary considerably, some variations of *P. smintheus* have developed, but they remain true to our country, and deserve proper denomination.

One of the prettiest variations in its way, which was found by Capt. Geddes, near Fort Calgarry, some years ago, and lately by the botanists of Dr. Dieck, the owner of the renowned Arboretum at Zoeschen, Germany, at Spence's Bridge, both places being in British Columbia, I have named var. *nanus*. It is the smallest kind of *smintheus* found in America and exceedingly pretty.

It is of the *sedakovii* order, but more pronounced. In the ♂ not a vestige of red is left, either on primaries or secondaries. The

apex of primaries and the greater part of the exterior margin are of vitreous scales. The only markings on secondaries being the black basal margin fading out towards median cell, and a prominent discal spot.

The females are of the *hermodur* order—dark, the entire apical and outer marginal part being transparent on primaries; the two subcostal red spots always looking faded. No other red markings on primaries. Secondaries are equally dark and vitreous along exterior margin; the red ocelli marked with whitish centres and all the black delineations prominent. Expanse of wings: ♂,  $1\frac{3}{4}$  inch.; ♀,  $1\frac{7}{8}$  inch.

Our present nomenclature of *P. smintheus* stands as follows:

- **Parn. smintheus** Doubl.-Hew.
  - *intermedius* Mén.
  - Var. *behrii* Edw., Nevada, Utah.
  - Var. *sedakovii* Mén., Colorado.
  - Var. *hermodur* Hy. Edw., Colorado.
  - Var. *nanus* Neumoegen, British Columbia and Montana.

I do not understand why the var. *sedakovii*, where there are no red markings in primaries and at times some in a universal way only in secondaries, has never been mentioned in any of our catalogues. It is to be found in the canyons of middle and south Colorado, and occasionally in Montana and British Columbia.

**Arctia dieckii** nov. spec.

Head, palpi and orbit of eyes black; black vertex between the antennæ, which are bi-serrate and entirely black. Thorax yellowish white, with two prothoracic dots and three large thoracic maculations of black color. Palpi hairy; abdomen and legs black. Primaries black; costa has a yellowish white edge from base to about apex; inner margin narrowly edged with yellowish white from base to over half its extension. Fringes alternately yellowish white and black. Markings of yellowish white as follows: the usual horizontal broad line from base to within outer margin; two transverse lines divergent on costa, but nearing each other, the anterior line resting on horizontal streak; between the anterior transverse line and outer margin the usual zigzag line from costa to horizontal streak, forming the two irregular, triangular fields; two irregular small spots, costal and subcostal respectively, between base and interior line. Secondaries and fringes entirely black, with the following markings of yellowish white color; around disc irregular, small blotches enclosing it in semicircular shape and extending somewhat towards exterior margin; an irregular submedian spot. Beneath the markings are the same. On secondaries there is another irregular blotch of yellowish white between base and discal ornamentation. Expanse of wings  $1\frac{1}{2}$  inch. Length of body  $\frac{3}{8}$  inch.

*Habitat*.—Spence's Bridge, British Columbia.

Type coll. B. Neumoegen.

This insect belongs to the *determinata* group, from which it is easily distinguished by its black body and antennæ, its intense black color of wings and its larger size.

Collected by the botanists of Dr. Dieck, of Zoeschen, Germany, in whose honor I have named it.

**Spingicampa bisecta** var. *nebulosa* n. var.

My indefatigable collaborator, Mr. Doll, has raised this charming insect. It is a ♀ of large size, and is heavily powdered with grains of blackish brown color.

On primaries the diagonal line from apex to the basal centre of interior margin is very prominent, forming a conspicuous line of blackish brown, the space between this line and exterior margin being especially powdered, somewhat fading towards margin. Discal spot prominent and suffused with grains of blackish brown. Secondaries of a rich yellow with a beautiful roseate basal hue fading towards centre.

Type coll. B. Neumoegen.

**Horama jalapensis** n. sp.

Head black; palpi creamy white; orbit of eyes black. Antennæ black, with whitish tips; a vertical spot of creamy white between antennæ. Patagiæ and thorax scaled with creamy white spots. Abdomen black, with segments of creamy white, the segment near thorax being broken up in creamy white spots. Legs heavily tufted, as in *H. texana*. The tuft of black color with stem and tips of creamy white hair. Primaries and secondaries, and fringes of uniform grayish black color above and below. By these peculiarities this insect is easily distinguished from *Horama texana*. Expanse of primaries  $1\frac{1}{2}$  inch. Length of body  $\frac{3}{8}$  inch.

*Habitat*.—Jalapa, Mexico. Collected by Mr. Wm. Schaus, Jr.  
Type coll. B. Neumoegen.

SYNTOMIDÆ.

Genus **IRA** Neumoegen.

Wings of the peculiar shape of *Syntomis*, but not vitreous. Secondaries extremely narrow, ovate-lanceolate, about one-third the size of primaries. From base to apex of secondaries, traversing submedian nerves, a semi-vitreous, very distinct fold. Head rather small, free. Eyes prominent; palpi distinct, with acute terminal joint. Antennæ biserrate. Body slender, not quite the size of primaries. Legs slender, without tibial spurs.

The characteristic of this genus is its intense rose color of wings, thorax and body, the anal half of latter being dark black, much resembling some South American *Zygænid*s in its ornamentation. It is a native of Cuba and very rare, as Dr. J. Gundlach has only found this one insect in his forty years' researches.

*Ira gundlachiana* n. sp.

Head and orbit of eyes black; palpi white; a white vertical spot between antennæ, which are moderate, bi-serrate and of brown color. Thorax and patagix of rose color, with indications of black centre line, tipped in white. Abdomen above, thoracical half of beautiful rose color, anal half black, with slight rose colored tuft; below, entirely white, with black segments. Legs white, with black spots, especially discernible in posterior tibiæ. Primaries nearly three times as large as secondaries, of the most beautiful, intense rose color. Costa, anterior and half of inner margin narrowly edged with black; between costa and exterior margin a large, apical, triangular field, with two distinct, white, centre spots; an irregular, nearly reniform-shaped bulge on lesser half of exterior margin, resting with its point on apex of inner margin, with a white centre spot. The nerves of anterior edge of median disc tinged in black and resting on them a small, irregular, black discal spot. Secondaries of the same rose color, irregularly triangular shaped, and more drawn out towards apex; about one-third the size of primaries, margined with black and containing irregular, small, white, centre spots on anal margin. From base to apex a straight, semi-transparent fold or groove through wing, dividing it, as it were, in two fields; upper edge of fold slightly tinged with a black line, which becomes more prominent and irregular at conjunction with apical margin; centre line of this so-called groove of whitish tinge; beneath the same markings as above. Expanse of primaries  $1\frac{1}{8}$  inch. Expanse of secondaries  $\frac{1}{2}$  inch. Length of body  $\frac{1}{4}$  inch.

*Habitat.*—Plantation Jagey, southeast Cuba.

This gorgeous *Syntomid*, resembling the Zygenid genus *Metrophila* of South America, was discovered by Dr. J. Gundlach about three years ago. He has graciously left to me the task of describing it, and I thought it only a small token of my gratitude towards a life-long tutor and friend, to call it after him.

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Paris, Feb. 9, 1890.

DEAR SIR:—Having had an opportunity of examining an original type of Zeller's *Pempelia petrella*, Isis 1846, p. 771, and 1848, p. 886; V. z.-b. Ges. 1872, p. 545 (99), I find it is the same species described by Walker under the name of *Trachonitis crectalis*, so that this latter name must give way to Zeller's.

To the Catalogue of N. A. Species I add *Myelois grossipunctella* Rag., a very interesting species submitted to me by Mr. C. V. Riley, who informed me that the larva has been detected in California living predaceously on the "fluted scale," or "cottony cushion-scale" (*Icerya purchasi*), adding that it has probably been introduced from Australia. I described the species from a specimen in Guenée's collection which bore no indication of origin.

Yours truly,

E. RAGONOT.

SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 13, vol. vi.)

LEPTURINI.

This tribe contains a great number of species which occur on flowers, and are usually prettily colored and clothed with fine pubescence. The characters in which they agree are those of the fourth division of Cerambycinae, stated in our last paper and the following: palpi always unequal, the maxillary elongated; mandibles flat, acute, and fringed on the inner margin; legs slender and never very short. Three divisions may be first made.

First joint of hind tarsi with the usual brush of hair beneath (except in-certain Acmaeops); prothorax usually armed, or tuberculate at sides.

Prosternum prominent between the coxæ; antennæ short, thickened externally . . . . . **Rhagium.**

Prosternum not prominent, front coxæ conical, protuberant; head not suddenly constricted behind; antennæ slender . . . . . **Toxoti.**

First joint of hind tarsi without brush-like sole; prosternum not prominent; head strongly and suddenly constricted behind; eyes finely granulated, deeply emarginate; antennæ slender . . . . . **Lepturæ.**

**RHAGIUM** Fabricius.

**R. lineatus** Oliv., Ent. iv, 69, p. 13, t. 3, fig. 22; Hald., Trans. Am. Phil. x, p. 58; Harris, Ins. Mass., p. 93, etc.

Length 13—20 mm. = .54—.80 inch. *Habitat.*—Sitka; N. Y., Va., N. C., Mass., Mich., Me., Md., La., Pa., Lake Sup., N. Mex., Or., Vanc., Idaho, Can., Ft. Simpson, Mackenzie River.

An abundant and peculiar species. The antennæ are not as long as head and thorax together, and the fifth and following joints are decidedly stouter. The thorax is strongly and acutely armed at the sides and bears a discoidal smooth space. The elytra bear three smooth, strongly elevated costæ. Color black, or partly brown, mottled with lighter pubescence.

**TOXOTI.**

Eyes large, coarsely granulated; spurs terminal . . . . . **Centrodera.**

Eyes smaller, coarsely granulated; spurs terminal . . . . . **Xylosteus.**

Eyes variable; tibial spurs not terminal . . . . . **Toxotus.**

Eyes finely granulated; tibial spurs terminal.

Prothorax acutely armed on the sides.

Eyes moderate, feebly emarginate . . . . . **Pachyta.**

Eyes large, strongly emarginate . . . . . **Anthophylax.**

Eyes very small, entire . . . . . **Plodes.**

Prothorax obtusely angulated, or rounded on the sides; eyes small, entire.

Mesosternum not protuberant . . . . . **Acmaeops.**

Mesosternum protuberant . . . . . **Gaurotes.**

The above arrangement of genera is copied from the "Classification."

**CENTRODERA** LeConte.

Prothoracic tubercle acute.

Elytra unicolorous, truncate at tip . . . . . **decolorata.**  
Elytra irregularly vittate and blotched; rounded, and slightly dehiscent at tip . . . . . **picta.**

Prothoracic tubercle obtuse

Elytral pubescence arranged in lines . . . . . **sublineata.**  
Elytra uniformly pubescent . . . . . **nevadica.**

**C. decolorata** Harris, Injur. Ins. 1841, p. 93; Lec., J. A. P. ser. 2, 1 p. 325; *rubida*, Hald., Trans. Am. Phil. x, p. 58; Proc. Ac. Phil. iv, p. 373. Length 27½ mm. = 1.10 inch. *Habitat.*—N. Y., Mich., Can., Mass.

Eyes very prominent; antennæ about as long as the body; prothorax constricted and much narrower before the tubercle than behind, channelled longitudinally on the disc; elytra at base nearly twice as wide as thorax, slightly narrower posteriorly, coarsely punctured, confluent near base and more finely towards tip. The insect is entirely rufotestaceous, very sparsely pubescent.

**C. picta** Hald., Trans. Am. Phil. x, 1847, p. 58. Length 13 mm. = .52 inch. *Habitat.*—N. Y., Pa., S. C.

Easily known by the smaller size and elytral coloring, which is not caused by pubescence, but lies in the elytra. The antennæ are extremely slender, the thorax elongate, scarcely narrower in front than behind, and the elytra are decidedly narrowed towards tip and slightly sinuate behind the humeri. The pubescence is nearly as sparse as in the preceding.

**C. sublineata** Lec., Proc. Ac. Phil., 1862, p. 40. Length 14 mm. = .56 inch. *Habitat.*—N. C., Pa.

The pubescence is more abundant, and so arranged on the elytra, which are very faintly costate, as to give the appearance of lines. Prothorax with tubercle not prominent, somewhat obtuse, narrower in front and bearing a sharply-defined, median channel. Antennæ longer than the body ♂, less slender than in preceding. Color dark piceous.

**C. nevadica** Lec., S. M. C. No. 264, p. 205. Length 17 mm. = .68 inch. *Habitat.*—Nev.

"By the obtuse tubercles of the prothorax this species resembles *C. sublineata*, but the punctuation is finer, the prothorax is scarcely narrower at tip than at base, and there is no appearance of lines on the elytra." (Lec.) Color, fuscó-testaceous.

**XYLOSTEUS** Frivald.

**X. ornatus** Lec., S. M. C., No. 264, p. 205.

Length 14 mm. = .56 inch. *Habitat*.—Oregon.

Black, head and thorax densely, elytra more strongly punctured, each with two yellow marginal spots. The antennæ are about three-fourths the length of the body (♀). The elytral spots are transverse and directed towards each other in a diagonal direction, and extend nearly one-half the breadth of the elytra. The genus is hardly distinct from *Centrodera*.

**TOXOTUS** Seaville.

This genus is sharply defined by the spurs of the hind tibiæ, which are inserted at the base of a deep excavation instead of (as usual) at the extreme end. The species are quite similar in form, and all of considerable size. The thorax is constricted before and behind, and tuberculate at the sides; the tubercle varies from a large acute process in *Schaumii*, to an obtusely rounded, scarcely evident form in *obtusus*. The elytra are sinuate at anterior third (not strongly in *cinnamopterus*), and are usually obliquely truncate at tip. The differences between the sexes are often quite marked, besides the greater length of the antennæ in ♂. In *Schaumii* the ♀ is very much larger, and in *vittiger*, *virgatus*, *vestitus* and *obtusus*, the abdomen is ferruginous in ♂, and wholly or partly dusky in ♀. The species may be separated by the following table, which has been corrected by Dr. Horn:

*Synoptic Table of Toxotus.*

Elytra at apex obliquely truncate.

Third joint of antennæ very decidedly longer than fourth.

Elytra unicolorous, black; body either yellow, or black; legs bicolored.

**Schaumii.**

Elytra rufo-testaceous, often varying to black; legs unicolorous.

Eyes larger and more coarsely granulated; elytra not at all costate.

**cinnamopterus.**

Eyes smaller and less coarsely granulated; elytra vaguely costate.

**vestitus.**

Elytra bicolored, vittate.

Black, with basal, lateral and apical margins broadly rufo-testaceous; legs pale . . . . . **nubifer.**

Black, with marginal and discal vittæ yellow.

Discal vitta not reaching apex; species of larger size and robust facies.

**flavolineatus.**

Discal vitta entire; species smaller and of slender facies . **trivittatus.**

Rufo-testaceous, with sutural and discal black lines enclosing broad, golden, pubescent vitta . . . . . **virgatus.**

Third joint of antennæ very little longer than fourth; elytra unicolorous, black, varying to rufotestaceous; apex obliquely emarginate and subbidentate . . . . . **cylicollis.**  
Elytra at apex obtusely rounded; disc not costate and scarcely pubescent.

**obtusus.**

**T. Schaumii** Lec., J. A. P. 1850, p. 320; Proc. Ac. Phil. 1862, p. 41.

Length 19 mm. = .76 inch. ♂; 25 mm. = 1.00 inch. ♀. *Habitat.*—Ohio, Ill., Vt., Can.

Entirely black, finely pubescent, except the central part of femora yellow. The elytra finely costate, and the black color shading into blue from the dense pubescence; var. *croceus*. Differs ♂ and ♀ in the color of the body, which is yellow, except the tibiæ, tarsi and antennæ, from second joint outwards, which are black as usual. I have this form from Vermont (Mr. Roberts) and northern Illinois, where Mr. George P. Welles has taken it abundantly with the black *Schaumii*. Dr. LeConte mentions (Proc. Ac. Phil. 1862) that the male is frequently yellow, but the yellow female appears to have been unknown to him.

**T. cinnamopterus** Rand., Bost. Jour. II, 1838, p. 45; *æsculi* Hald., Trans. Am. Phil. 1847, x, p. 59.

Length 10—13 mm. = .40—.50 inch. *Hab.*—N. C., Ill., Mass., Pa.

Uniform pale fulvous in color, thorax darker, eyes large and black. Elytra silky pubescent. The ♂ is smaller, and the antennæ are slightly longer than in ♀.

**T. vestitus** Hald., l. c.

Length 10—15 mm. = .40—.60 inch. *Hab.*—Oreg., Cal., Vanc.

This species varies considerably in color, being rufo-testaceous, with legs of the same color, or with the legs darker; or it may be entirely black. The legs appear to be always black in black specimens, and the head and prothorax are usually black. The elytra are vaguely costate, and the pubescence, especially between the costæ, is arranged transversely.

Var. *ater*: I suggest the use of this name to distinguish the form, which is entirely black.

**T. nubifer** Lec., Proc. Ac. Phil. 1859, p. 80.

Length 17.5 mm. = .70 inch. *Hab.*—Tejon, Cal.

This species I have not seen, and am indebted to Dr. Horn and to Dr. LeConte's description for the characters used in the table. The original description is: "Head black, punctate; thorax black, finely punctate, constricted before and behind with a large, obtuse, lateral tubercle; elytra with prominent humeri, gradually narrowed behind; apex obliquely truncate inward; densely, but finely punctate and rugose, blackish, with basal, lateral and apical margin rufo-piceous; beneath black; abdomen, antennæ, palpi and legs rufo-piceous."

**T. flavolineatus** Lec., Proc. Ac. Phil. 1854, p. 18; Ent. Rep. 1857, p. 63.  
Length 25 mm. = 1.00 inch. *Hab.*—Cal.

This species should be easily recognized by the size and characters of the table. The discal vitta (*vide* Lec.) is abbreviated in front.

**T. trivittatus** Say, J. A. P. III, p. 422, 1823; Bland, Proc. Ent. Soc. I, 1862, p. 270; *vittiger* Rand., 1838, l. c. p. 29; *nigripes* Hald., l. c.  
Length 15—17 mm. = .60—.68 inch. *Hab.*—Can., Me., N. Y., Pa., N. Ill., Miss.

This species has been known in collections generally under Randall's name *vittiger*, but Say's date is fifteen years earlier. The differences between the two have been summarized by Randall and Bland as follows: *vittiger*, ground color black, third joint of antennæ longer than fifth; *trivittatus*, ground color reddish yellow, third joint of antennæ about equal to fifth. Both characters are found to vary in other species, and *vide* Dr. Horn there is only one species.

**T. virgatus** Lec., Trans. Am. Ent. Soc. v, p. 67.  
Length .16 mm. = .64 inch. *Hab.*—Mont., Or., Vanc., British Columbia.

This species resembles *vestitus* in the arrangement of the elytral pubescence, but differs by the black discal lines, between which the pubescence is very abundant and often golden in color, making it a very pretty insect. The discoidal vitta is narrower than in *vittiger*, and does not descend to the inflexed portion.

**T. cylindricollis** Say, J. A. P. III, 1823, p. 417; *atratus* Hald., l. c.; *dentipennis* Hald., l. c.; Dej., Cat. 3 ed., p. 380; *dives* Newn., Ent. p. 68; *sericeus* Knoch., in litt.

Length 22 mm. = .88 inch. *Hab.*—Pa., Ga., N. Y., Ill., Can., Ill., Ala., Miss.

Rufous, elytra and tarsi darker. The tips of the elytra are obliquely truncate, and the angles produced, subdidentate.

**T. obtusus** Lec., S. M. C. No. 264, 1873, p. 206.  
Length 15 mm. = .60 inch. *Hab.*—Yellowstone Basin.

Dr. LeConte's description says "differs from all the other species before me by the less deeply constricted prothorax and more obtusely rounded lateral tubercles; the eyes are smaller than usual and finely granulated, but more convex than in *vestitus*, with which it agrees in this character; the third and fifth joints of the antennæ are equal, and the fourth joint is two-thirds as long. The pubescence is extremely short and fine."

(To be continued.)

### A. Melanic *Argynnis Bellona*.

BY P. J. SCHMITT.

A strongly-marked, melanic *Argynnis bellona* was captured here during the last collecting season, and a description of it is herewith given.

It differs from the normal form in these particulars: The basal two-thirds of fore wings, upper and lower side, and upper side of hind wings are black. There are a few scattered, fulvous scales at the base of fore wings; on lower side they are slightly more numerous. The outer third is fulvous, but on the fore wings this is much sooted with black scales, especially towards the apex. The terminal are confluent with the subterminal spots, forming a row of five, oblong marks. The veinlets terminate in oval, black blotches. On the under side of the fore wings the fulvous outer third is very strongly tinged with rusty brown, and the oval, terminal spots of above are indistinct. On the hind wings the black of basal two-thirds extends also narrowly along the veinlets to the outer margin; a very distinctive feature. The terminal lunules are wanting, and the subterminal spots diffuse. In the black a very slender streak of fulvous scales indicates the position of the small vein closing the cell. The lower side of the hind wings has no black, but differs from the normal form by the absence of the usual bands, markings, or spots. Taken Sept. 11, 1889.

St. Vincent College, Pa.

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Note on the season of *Pleocoma behrensii* Lec.—Upon the 19th, 20th and 22d of October, last, and while the second period of heavy rain was at its height, I went forth in search of *Pleocoma*, and on each of the above dates I was successful. I continued the search up to the 27th of the same month, when I relinquished the pursuit, not having met with a *Pleocoma* after the above-named dates. To-day, the 19th of February, just four months after the first capture of the season, a perfect, living ♀ was brought to me, it having been dug out of a bank of black adobe.—J. J. RIVERS, University of Calif.

Herr Johann Fruhstorfer, a young German naturalist of Berlin, has spent considerable time in collecting during the past year in Ceylon. He was assisted by fourteen other collectors, Germans and natives, and has succeeded in amassing a collection of insects which he estimates as containing 25,000 Coleoptera, 7000 Lepidoptera, 3000 Orthoptera, a like number of Neuroptera, and a thousand of spiders and centipedes. He has also collected in Brazil and Malacca, and in May expects to visit Java and Borneo. Many specimens of his collecting will doubtless find a repository in German museums.

F. H. C.

## DESCRIPTION OF A NEW CYCHRUS.

BY J. J. RIVERS.

**C. fuchsianus** Rivers.—Form and general aspect of a large *ventricosus*. Piceous black, moderately shining. Head moderately elongate, more or less transversely wrinkled, a slight impression at middle of clypeal margin, lateral ridge of genæ rather deeply notched. Thorax cordate, or little wider than long, deeply sinuate posteriorly, hind angles rectangular, median line distinctly impressed, apical impression moderate, basal transverse impression deep, longitudinal impressions feeble, surface finely transversely wrinkled. Elytra oval, more broadly in the female, striate, striæ closely punctured, the alternate intervals wider and with punctures as coarse as the striæ, intermediate intervals impunctate, inflexed portion of elytra rather coarsely, not deeply punctured. Body beneath smooth, shining. Length .85—1.00 inch. ; 21.5—25 inch.

The male has the first three joints of the anterior tarsi papillose beneath as usual in the *ventricosus* group.

Closely related to *ventricosus*, but differs in the elytral sculpture. The intervals in the latter species are equal and smooth; in this new species are alternately wider, and the wide intervals are alone punctate. At the sides the striæ are so confused in the present species as to render it impossible to count those on the outer third, while in *ventricosus* the striæ may be easily enumerated.

For some years I have had the ♀ of this insect in my collection as an undescribed species, but thought it allied to *striatopunctatus* by the alternating of the punctured intervals, but Mr. Charles Fuchs having recently received three examples from Sonoma County, two of which are males, I have been enabled to find its true position. With the aid of Horn's\* "Synopsis of the species of *Cychnus* inhabiting Boreal America," it is evident, by the three papillose tarsal joints that it belongs to the subgenus *Brennus* of Mots., and should be placed next after *C. ventricosus* Dej., as the two forms have many characters in common.

Occurs in Eldorado and Sonoma Counties, Cal.

The above description having been sent me by Mr. Rivers for publication, I avail myself of the opportunity to make known a second species.

GEO. H. HORN, M. D.

**C. merkelii** Horn.—Form and general appearance of *canadensis*, piceous-black shining, elytra with distinct cupreo-violaceous lustre. Head and thorax smooth, the latter cordate, a little broader than long, sides arcuate in front, oblique posteriorly, hind angles very obtuse, disc slightly convex, apical transverse impression faint, median line deeply impressed between the apical and

\* Trans. Amer. Ent. Soc. VII, December, 1878.

transverse basal line, the latter faint, longitudinal impressions of the angles short and shallow. Elytra oval, one-fourth longer than wide, disc slightly flattened, deeply striate, punctuation indistinct, not crenate, intervals convex, smooth. Body beneath piceous-black, smooth, shining. Length .43 inch.; 11 mm.

This species belongs to the *Sphaeroderis* group, and is allied to *stenostomus* and *canadensis*. The thorax is, relatively to the elytra, smaller than in either of the above species, and more narrowed at base, and differs especially in having the basal impressions faint and short and absolutely without punctures. Its form is more slender than either of the above-named species, and is not unlike *Nomaretus bilobus*.

One female specimen obtained from northern Idaho, and kindly given me by Mr. Aug. Merkel, whose name I attach to it in recognition of many favors.

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### NOTES AND NEWS.

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Even old scientists will commit indiscretions. Our old and venerable friend, Dr. Ivan Gundlach, having persisted in wading through the malarious swamps in the vicinity of the Aguadore River, southeast Cuba, to discover new wonders, has paid the tribute of human frailty. He has contracted a severe laryngial affection and been ordered back to Havana by the physicians of Santiago. We wish our friend, who will celebrate his 80th birthday next July, a speedy recovery.

From Tatsienlou, Thibet, the mountain abode of the renowned Abbé David, from whom Mr. Oberthür received years ago those wonderful lepidoptera described in his "Etudes Entomologiques," I receive shipments now by way of Europe. Many of the insects are entirely new to science, and I shall refer to them in these columns in the course of time.

Capt. Yankowsky has started on an extended tour up the Yangtse-Kiang River, Central China, and will go through western Szechuen and Mount Oune, territories never before visited by any collector. I have a share in the expedition, and hope for great spoils.

The rare *Smerinthus cerysii* and *Platarctia parthenos* have been, last season, raised from the egg, and Prof. Braun will shortly publish their life-history.

The last two volumes of the "Butterflies of Japan," by the late Mr. Pryer, have just been published by the estate, and show what an ardent and thorough-going scientist this gentleman was.

B. NEUMOEGEN.

## Preparatory Stages of *Arachnis picta* Packard.

BY HARRISON G. DYAR.

EGG.—Spherical, the base slightly more flattened than the summit. Color light pearly gray. Diameter about 1 mm. The eggs are laid in masses of fifty or less, close together, but only in a single layer. About four hundred eggs are laid by one female. The duration of this stage is about two weeks.

FIRST LARVAL STAGE.—When newly hatched, the head is slightly cordate, black and shiny, the mouth pale. A few black hairs on its surface; cervical spot straight in front, curved behind, black and shiny as the head. The body is pale, dirty whitish, with long black hairs growing from blackish warts, which are arranged as in the mature larva. Thoracic legs black. Length 2 mm. After hatching, the little larva makes its first meal of its egg-shell, which it sometimes completely devours. As the stage progresses the body becomes greenish white, the warts black, some of them brownish at their bases forming a subdorsal and substigmatal brown band on the middle segments. Legs black.

SECOND LARVAL STAGE.—Head as before. Body pale whitish, the warts large and black, with brown irrorations between those in the subdorsal and subventral spaces. Thoracic feet black; abdominal black outwardly. Hair black, about 1 mm. long. Length of larva about 4 mm.

THIRD LARVAL STAGE.—Head shiny black. Body and warts black, with a white dorsal line and pale stigmatal band. Hairs black, whitish from the warts in subventral space. Length 6 mm. As this stage approaches completion the body assumes a purplish black color, and the lines are yellowish.

FOURTH LARVAL STAGE.—Head black and shiny, with a few short black hairs. A paler line above the mouth concolorous with the base of the palpi. Body and warts black, a narrow, dull, whitish dorsal line. Hair bristly and black, paler from the warts in subventral space. Feet shiny black, the claspers of the abdominal, paler. Length 9 mm.

FIFTH LARVAL STAGE.—Head as before. Body black, dorsal line whitish, narrow and faint. Hair very bristly, black, but mixed with brown hairs, especially from the lower warts. Length .13 mm.

SIXTH LARVAL STAGE.—Head black, the mouth slightly paler, a few hairs about the mouth. Body black, with a trace of dorsal line. Abdominal legs reddish. Hair black, mixed with brown. Length 20 mm.

SEVENTH LARVAL STAGE.—Head as before, but on the vertex posteriorly is a paler patch; cervical spot black, bisected. Body black, a mere trace of dorsal line on the first few segments; the warts are brownish, and spiracles dirty white, otherwise as before. Length 30 mm.

EIGHTH LARVAL STAGE.—Mature larva. Head pale brown, but largely black in front. Mouth brownish, but the ends of the jaws black; a few fine, dark hairs. The warts are arranged as follows: (1) a row on joints 5 to 12 in subdorsal space situated anteriorly; (2) subdorsal and (3) superstigmatal row, both replaced on joint 2 by the cervical spot; (4) substigmatal row, the last three coalesced on joint 13 in one large wart; (5) and (6) two rows in the subventral space, there being only one row on joints 2 and 4 situated intermediately, and the lower, slight on joint 13; (7) four small warts on the venter of each of the legless segments. Body black, the warts large and pale brown. Thoracic feet dark brown, the abdominal dull crimson. Spiracles orange. Hair bristly, black, mixed slightly with brown. Length 45 to 50 mm.

The duration of each stage was from eight to ten days. When mature some of the larvæ pupated at once, but others hibernated for the space of three weeks before pupation, although the weather was warm.

COCOON.—A thin netting of white silk, without any larval hairs, which remain on the cast skin. The silk of the cocoon is strung with little clear drops at the joinings of the threads.

PUPA.—Head small; thorax rounded, a slight depression behind it. Abdomen curved, the ventral and stigmatal sides straight. Two rows of tufts of stout spines on the dorsum of the abdomen, the upper situated anteriorly and the lower posteriorly on the segments, two more rows at the spiracles smaller, and others below only slight; cremaster, two tufts of spiny hairs with their ends minutely hooked. Color, black; thorax and cases shiny and creased. Abdomen dull, covered by a slight bloom, minutely punctured.

FOOD-PLANTS.—Probably numerous. The larvæ fed readily on malva, clover, alfalfa, geranium, etc.

Larvæ from Los Angeles County, Cal.

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The exertions of various well-known gentlemen point it that we will at last have some active collecting of Lepidoptera done again in these United States. Professional collectors of the type of the late Boll and Morrison, are sadly needed, and would find liberal assistance for good work.

B. NEUMOEGEN.

## Descriptions of the Preparatory Stages of *Edema albifrons* A. and S.

BY WM. BEUTENMULLER.

EGG.—Pale green, subglobose, slightly concave at the base, smooth, shining. Length .80 mm. Width .50 mm. Duration of this stage thirteen days. Laid in small masses on the underside of leaves.

YOUNG LARVA.—Head large, jet-black shiny, with a few white hairs. Body yellow, with two pairs of minute, wart-like elevations on each segment along the dorsal region. The elevated segment is humped and followed by two brown spots. Along each side there is also a series of wart-like elevations which gradually diminish in size towards the posterior part of the body. All the warts bear a short whitish hair. Body beneath concolorous to the above. The feet are white, semi-translucent; as the larva grows older, fine black stripes begin to appear along the dorsal region, and which are broken by the wart-like elevations. Length 2 mm. Duration of this stage seven days.

AFTER FIRST MOULT.—The head now becomes brick-red or yellow, otherwise as in the previous stage. The larva in this moult begins to attack the leaf, while the young larva eats only the parenchyma of the leaf. Length 4 mm. Duration of this stage eight days.

AFTER SECOND MOULT.—Between the black stripes along the dorsal region there is now present a canary-yellow stripe, and across the posterior segment is a series of small black spots. The hump is now brick-red. Length 6 mm. Duration of this stage seven days.

AFTER THIRD MOULT.—No difference from that of the previous moult. Length 10 mm. Duration of this stage six days.

AFTER FOURTH MOULT.—Same as the previous one, except somewhat deeper in color and the marking more distinct. Length 17 mm. Duration of this stage five days.

AFTER FIFTH, THE LAST MOULT.—The head is now bright coral-red, as is also the hump on the eleventh segment. Along the dorsal region is a series of six fine black stripes on the whitish ground color, and are broken on the junction of each segment. Along the subdorsum is a rather broad canary-yellow stripe, and along the sides are four black and yellow, or black and white stripes; the black stripes being the finest. The ground color sometimes assumes a pinkish color. Body beneath dirty white with black markings. The thoracic feet are yellow, and the abdominal legs are concolorous with the body. Length 28 mm. Full grown 42 mm. Duration of this stage nine days.

The eggs from which my observations were made were laid on June 19th, and the young larvæ emerged on July 2d. The first moult took place on July 9th, the second moult on July 17th, the third moult on July 24th, the fourth on July 30th, and the last moult on August 4th. The larvæ were full grown on August 12th.

The cocoon is irregularly oval, and is of a tough, sordid white texture, and is spun on the ground amongst leaves. Single brooded.

Food-plants: various species of oaks.

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### A New Species of *Agrotis*.

BY JOHN B. SMITH.

#### *Agrotis atristrigata* n. sp.

Ashen gray, black powdered; collar with a black, transverse line. Primaries heavily black powdered, all the transverse maculation obsolete. Orbicular elongate, narrow, fused with the small, upright reniform, else all the normal maculation absent. A paler shade runs from the end of the cell to the apex, and veins 3 and 4 are white marked nearly to the margin, lightening that region. The fringes are cut with white; secondaries white, with a broad, soiled, outer margin. Expands 1.20 inches; 30 mm.

*Hab.*—N. W. British Columbia.

This species has all the structural characters of *Hollemani*, and comes between that species and *biclavis* in the synopsis. The ordinary spots are very small and scarcely distinct. The specimen is a poor one and badly rubbed, and would not have been described, but that it was a ♂, and the affinities were so distinct as to render its recognition certain, should other specimens be turned up.

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Among the Noctuæ from Thibet which I received some weeks ago, quite a number prove to be well-known insects of the European fauna, while a few greatly resemble our "American cousins." I shall refer to it in time after having worked up the material on hand.

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At the entomological auctions at Stevens', in London, fabulous prices are often realized for rare specimens or showy insects new to science. Some months ago as much as £20 and £30 was paid for *Assam* and *Bhotan arctiida*, and the purchasers were happy at that.

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A portrait of Prof. S. A. Forbes, fourth State entomologist of Illinois, together with a pen sketch of his life, adorns the Trans. Illinois State Hort. Soc. for the past year.

## NEW CALIFORNIA HOMOPTERA.

BY E. P. VAN DUZEE.

(Continued from p. 52, vol. vi.)

### 5. *Thamnotettix subænea* n. sp.

Form and size of *T. abietina* Fall. Broad. Pale yellow, obscurely marked with fulvous. Elytra subhyaline, veined and marked toward the costa with fulvous brown and exhibiting by oblique, light, strong, coppery reflections, intensified by the highly iridescent wings beneath; lower surface pale testaceous. Length: male, 6.5 mm.; female, 7 mm.

Head a little wider than the pronotum; very bluntly rounded; vertex about one and one-half times as long medially as next the eye, disc flattish, with a transverse depression behind the tip; a central line connecting before with a transverse spot on the depression, and two irregular spots on the hind border near the eyes, pale fulvous. Sometimes the latter spots are divided, and there may be two small points near the apex. Front broad above, occasionally with a few short, pale brown lines each side; sutures of the face more or less embrowned. Loræ broad. Clypeus slightly widened at the rounded tip. Antennal seta rather long. Eyes brown. Pronotum; anterior margin straight; sides very short, with a black spot below the edge; latero-posterior margins straight, the angles rounded. Surface pale, with six short, fulvous stripes not reaching either margin, the lateral ones frequently obsolete, scutellum pale, basal angles, two dots between them and the central line, a little dusky in fully colored examples; edge whitish, with two black dots on each side. Beneath and legs pale or soiled white; femora lineate with pale brown; tibiæ with black dots at the base of the spines. Elytra pale fulvous, almost hyaline, infuscated toward the suture, where there is a brown stripe, sometimes only indicated on the base and apex of the clavus; an indistinct whitish band crosses the elytra near the middle, strongly distinguished on the suture near the tip of the clavus; nervures copper colored, at the apex margined with brown. The whole surface has a coppery reflection, almost iridescent in some lights, produced, in part at least, by the highly iridescent wings beneath. Nervures of the wings brown. Abdomen pale testaceous, with a black line on the venter at each side next the base of the connexivum, sometimes broken into spots; margin of the dorsal segments broadly black, or at least with a black spot at the posterior angle.

Last ventral segment of the female about three times as wide as the preceding, broadly rounded posteriorly, with a prominent central tooth; pygofers with marginal and a few discal pale bristles. Ultimate ventral segment of the male not differing from the penultimate; valve broad and short, rounded, with two black spots on the base, the plates fringed with white hairs.

Described from two females and one male (No. 223). This insect might readily be mistaken for a *Scaphoideus*, but the antennæ are shorter, and in general characters it agrees most nearly with the present genus, in which I have placed it provisionally.

### 6. *Thamnotettix coquilletti* n. sp.

Form of *T. kennicotti* Uhl. nearly. Pale yellow marked with fulvous, female; or whitish testaceous, marked with fulvous brown, male. Eyes, two

spots on the front of the vertex, and the basal angles of the scutellum black. Length: male, 4 mm.; female, 5 mm.

Head as wide as the pronotum, female; or a very little wider, male; obtusely rounded before. Vertex narrow, the fore and hind margins almost parallel; surface sloping anteriorly, passage to the front well rounded. Front rather wide; sutures above the antennæ parallel, below converging to the clypeus. Clypeus long and narrow, the rounded apex exceeding slightly the cheeks. Loræ narrow, somewhat elongated. Cheeks narrow, sides feebly angled just below the eye; first two joints of the antennæ thick, poorly distinguished, the first much narrowed at base. Legs: first joint of the anterior tarsi broad, of the posterior somewhat elongated. Posterior margin of the pronotum almost straight, lateral angles rounded. Neuration of the elytra as in our other species of *Thamnotettix*, except that the transverse nervure connecting the first and second sectors runs obliquely forward and inward.

Color: Male.—Head pale yellow; vertex tinged with fulvous against the eyes, and with a fulvous spot at the apex; immediately above each ocellus is a large, round, black dot; sutures of the front and clypeus from the antennæ to the tip of the loræ heavily lined with black; front above with two triangular brown spots converging to a fulvous point on the tip of the vertex, and diverging below, where they are interrupted by some pale, transverse, broken lines. Eyes and antennal setæ brown. Pronotum whitish testaceous, with a transverse, fulvous brown band within the posterior margin, interrupted at the middle by a longitudinal white line, which is broadly bordered with brown, especially on the anterior margin. Scutellum pale yellow, with an oval black spot within the basal angles. Elytra fulvous brown; costal half of the corium hyaline almost to the apex; nervures slender, white, except at the apex, and broadly bordered with the same color on the clavus and inner half of the corium. Wings hyaline, smoky toward the tip, nervures thick, brown; pectoral pieces white, edged with black; sternum black. Legs white, base of all the spines with dark brown points; joints of the posterior tarsi embrowned beneath toward their apex; tip of the rostrum and the pulvilli black. Abdomen black; connexivum, disc of the venter and genitalia white.

Female.—Obscure pale yellow, elytra whitish; markings as in the male, but paler; face immaculate, or with faint indications of the superior brown spots; cheeks with a dusky cloud below the eye; black spots on the vertex distinct; fulvous markings on the pronotum more extended along the anterior margin. Abdomen and all beneath soiled white, immaculate or nearly so. Wings white, slightly iridescent, nervures inconspicuous.

Genital pieces.—Male: valve broad, occupying the concavity of the hind margin of the ultimate ventral segment, its posterior edge feebly convex; plates broad, triangular, sides slightly convex, apex obtuse, edge fringed with stout bristles.

Female.—Last ventral segment long, the edge nearly straight, with a minute central notch; pygofer short and broad, apex truncate, the apical submargin with a single row of stout spines, the sutural margin with a few short ones scattered along nearly its whole length. Ovipositor slightly exceeding the pygofer.

Described from one male (No. 626) and two female (No. 331) examples. This species is somewhat anomalous in the genus in

which I have placed it. In form, and especially ornamentation, it corresponds very closely with an undescribed Jassid found abundantly on willows in New York, that I have placed in *Calliscarta*, but this latter form has the elytral venation of *Cicadula*, while the present species agrees in this respect with *Thamnotettix*, where I prefer to place it for the present. This is one of those not uncommon cases where a species exists apparently for the sole purpose of puzzling the entomologist and showing him how little Nature appreciates his laboriously-founded and nicely-discriminated genera.

It affords me pleasure to dedicate this neat little Jassid to its discoverer, who is too well known to require words of commendation from me, else freely given.

**7 *Thamnotettix geminata* n. sp.**

Form of *Cicadula 6-notata* Fall., but larger. Dull green or greenish brown. Head yellowish white; anterior edge of the vertex with four large black spots; disc of the scutellum with two small, approximate, black points. Length 4.5 mm.

Head hardly as wide as the pronotum; obtusely rounded before, finely punctured. Vertex about one-fourth longer at the centre than next the eye, base with a fine impressed line. Sides of the front almost straight, slightly incurved toward the apex. Clypeus narrow, widened toward the obtusely rounded apex. Cheeks obscurely angled below the eyes. Pronotum scarcely angled at the sides, the posterior margin straight; surface with fine, transverse striæ and distant, scattering punctures. Basal ventral segment broad, posterior edge arcuated.

Color: Head yellowish white, tinged with fulvous on the disc of the vertex and around the eyes; short impressed line on the vertex and sutures of the front black; a large black spot occupies the apex of the head each side of the tip, and there is another on the margin of the vertex immediately behind each ocellus; antennal cavity and a few faint, transverse lines on the front black. Antennæ pale. Eyes black; pronotum dull greenish brown; behind the anterior margin is a black, wavy line, which becomes obsolete before reaching the lateral angles. Propleura sulphur-yellow, the other pleural pieces yellow on their outer half, their discal half and the sternal pieces black. Scutellum greenish yellow; transverse impressed line, two approximate black points before it, and a small triangle somewhat remote from each basal angle black. Elytra brownish hyaline, obscured toward the sutural margin; nervures slender, but distinct, pale, embrowned toward the apex. Wings hyaline, iridescent, nervures fuscous. Abdomen black, connexivum yellow. Legs pale whitish yellow; posterior tibiæ with a black line on the inner edge, their tarsal joints touched with brown. Last ventral segment and pygofers soiled white, the latter suffused with ferruginous.

Last ventral segment longer than the penultimate; posterior margin produced in a short angle each side of the middle, where there is a shallow incision on either side of the short, blunt central tooth; pygofers broad, abruptly reaching the end of the ovipositor.

Described from a single female example (No. 616). This species has much the appearance of a *Cicadula*, in which genus it might readily be placed, but for the characteristic venation of the elytra.

**8. *Thamnotettix flavocapitata* n. sp.**

Form of *T. cruentata* Panz. Pale yellow; head sulphur-yellow; elytra fulvous brown ♀, or olive-brown ♂; costa pale. Length: male, 5 mm.; female 5.5 mm.

Male; Head as wide as the pronotum, posterior margin regularly concave, anterior obtusely triangular. Vertex one-half longer at the middle than at the eye; passage to the front rounded. Front narrow, the sides almost straight. Clypeus widened toward the apex, which is truncated, and does not surpass the cheeks. Outer edge of the cheeks but feebly arcuated above, leaving a rather broad margin on the outer inferior side of the eye. Pronotum about one and one-half times as long as the vertex; hind edge scarcely concave; sides short, the angles rounded.

Color: Head sulphur-yellow, sometimes tinged with fulvous on the vertex; antennal setæ brown, eyes olive-brown. Pronotum olive-brown, paler on the anterior margin, behind which is a fine concentric line usually more or less obsolete. Beneath and legs pale yellow or whitish; propleura sulphur-yellow; tips of the tarsal joints and claws brown. Scutellum ferruginous brown, the transverse impressed line blackish. Elytra olive-brown or fuscous, subhyaline, with more or less distinct coppery reflections; costal half of the corium whitish hyaline; discal nervures pale yellow, indistinct, the costal clearer yellow; nervures of the clavus with a whitish spot next the suture. Wings whitish hyaline, highly iridescent; nervures thick, fuscous. Tergum black, broad, lateral and narrow posterior margins of the segments yellow. Venter yellow, base of the connexivum and of the first ventral segment black. Genitalia black; valves and plates yellow, the former with a dusky spot at base.

Genital pieces: Valve transverse; almost quadrangular, but with the outer corners well rounded. Plates triangular, sides well rounded toward the base, extreme tip a little produced; edges heavily fringed with long, soft hairs. Margin of the pygofers oblique, leaving the short, stout hooks at the inner acute apex of the triangular-ovate orifice; margin and apex armed with ten to fifteen stout bristles. Slender tips of the styles projecting conspicuously beyond the apex of the plates.

Female.—Pronotum, scutellum and elytra fulvous brown; nervures of the wings pale brown; abdomen yellow, disc of the tergum brown. The colors are paler than in the male, and the vertex is proportionately shorter and broader. Last ventral segment long; the rounded end with a broad notch including a prominent central tooth; pygofers a very little shorter than the ovipositor; at their base beset with rather short white bristles.

Described from six males (No. 601) and three females (No. 154).

(To be continued.)

#### ERRATA.

By a misunderstanding the 16-page form was printed before final proof was in, and the following escaped correction:

Page 63, line 6, for **Spningicampa** read **Sphingicampa**.

" 65, " 3, of article, for charcters read characters.

" 67, " 10, for Seaville read Serville.

" 68, " 3, for subbidentate read sub-bidentate.

" 69, " 31, for " " "

" 71, " 7, for distincty read distinctly.

" 72, " 18, for Ivan read Juan.

" 76, " 4, for fouth read fourth.

" 76, " 4 from bottom, for *arctiida* read *Arctiida*.

" 76, of the three short notes the first two should be credited to B. Neumoegen, the third to F. H. C.



# ENTOMOLOGICA AMERICANA

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No. 5.

## On the Probable Pollenization of Greenhouse Chrysanthemums by *Eristalis tenax*.

BY JOHN HAMILTON, M. D.

In many of the greenhouses throughout the United States, where Chrysanthemums are anywise extensively grown, a Dipteron, known to the proprietors as the Chrysanthemum fly or bee, makes its appearance early in October on the disclosing of the first flowers and continuing as long as the Chrysanthemums are in bloom. Its appearance and actions so greatly resemble those of the honey bee as to pointedly exemplify a mimicry that is all protective. I first observed it five years ago, in considerable numbers, on the large collection of Chrysanthemums in the greenhouses of the Allegheny parks; in many respects it acted very bee-like, hovering over the flowers till a selection was made, then alighting and burying itself among the petals, it would work among them diligently for a time and then fly away to another. From Mr. William Hamilton, the learned superintendent, I obtained the information that this fly was reputed to pollenize Chrysanthemums, and that this knowledge had been utilized by certain growers of seed, though he himself had never experimented to obtain any in that way. The fly does not meddle with any of the other flowers in the greenhouse, however fragrant, nor has it been seen outside by any of the operatives, nor by myself.

Mr. John Thorpe, of Pearl River, N. Y., a learned and distinguished florist, who makes a specialty of Chrysanthemums, to whom I wrote for information, courteously states that he has not noticed it outside his greenhouses at any time, and neither has he seen it until the first Chrysanthemums are in bloom, the date varying from October 5th to 13th, in six years; and further says, "I am sure they as-

sist in the pollenization of the flowers, as I have watched them working many hours; *Eristalis tenax* is the name it received from an entomological friend."

Reports from other sources are to the same effect, but no one has yet volunteered the statement that of his own knowledge seed has been so obtained, and it has been considered indelicate to put the question directly to the producers of this precious commodity; an experiment, however, would be no way difficult.

*Eristalis tenax* is an inhabitant of the old world, and accommodates itself to all climates from the Arctic regions of Siberia to the tropics in Africa, probably originating in Japan, the metropolis of Chrysanthemums. The knowledge of its existence in N. America dates back no further than 1875, when Baron Osten Sacken took a single specimen at Cambridge, Mass., after having collected Diptera throughout the United States, and yet, in 1884, it was known from nearly all parts of the country, from Massachusetts to Georgia, and westward to Washington. (*Psyche* ii, 188 and 260; *Can. Ent.* xiii, 176; *Trans. Ent. Soc. London*, 1884, p. 489-96). In the last cited article Baron Osten-Sacken, speculating on the mode of its introduction into North America, and its sudden appearance all over the country, states the only two possible ways. First, by introduction through the Atlantic seaboard; he fails, however, to inform us how this insect was likely to have been so extensively distributed in eight or nine years. Second, as being indigenous to Western, but not to Eastern America, it slowly worked its way across the Rocky Mountains eastward to Missouri, where, meeting with more favorable conditions, like *Doryphora decemlineata*, it suddenly spread to the Atlantic, where it was soon recognized by entomologists; but what these conditions were is not indicated.

Now, we may have it from both sources, as it is indigenous in Kamtschatka it may also be in Western North America, like so many other insects. And we may likewise have it by introduction, and if it really escaped commercial transportation, though seemingly strange considering its larva and imago habits, till near the time specified, its subsequent rapid and wide distribution is not incredible nor impossible when its relation to Chrysanthemums is considered, the craze for which during the last two decades has spread them to nearly every village and farm house in the United States. In the article cited above from the *Can. Ent.*, Dr. S. W. Williston states that this fly is often found "in houses early in October." Chrysanthemums, probably, might have been found there likewise.

No record of the food-habits of the mature *E. tenax* has been noticed; it cannot, however, be confined to greenhouse Chrysanthem-

mums, as it appears abundantly in early summer; there are, however, near one hundred species of *Chrysanthemums* distributed throughout the different countries it inhabits which, blooming at various seasons, may supply it with food, and it may have other resources at present unknown.

The larva is one of the rat-tailed maggots, and lives in any kind of compost or mephitic mud, the more horridly fœtid the better; the elastic tail, which is capable of being extended more than two inches to the surface, contains a double air tube, through which the larva breathes. To contrast—the larva revels and fattens in the vilest, most disgusting filth imaginable—the imago disports itself among the fairest bloom and draws sustenance from the loveliest of the lovely.

Under the caption "Drone Fly," Rev. J. G. Wood, "Insects at Home," gives a figure of the imago, and a very charming account of the larva and its habits, from which the foregoing account of the larva is mostly taken.

The mode of life of the imago outside of greenhouses seems to be unrecorded, at least such is the case in any of the American or European literature consulted, a knowledge of which mode is now of great interest, and must enter largely into any future attempt to account for its distribution in America.

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## REMARKS ON SOME WESTERN TENEBRIONIDÆ.

BY H. F. WICKHAM.

Every collector who has had the pleasure of traveling in that part of our country lying west of the Missouri River, must have noticed the great development of the Tenebrionidæ as regards the number both of species and of individuals. They form, in fact, the most noticeable feature of the Coleopterous fauna of that region, especially towards the South on the table-lands and plains of Texas, New Mexico, Arizona and Southern California.

Offering little variety in color, they differ widely in habits, and their forms are extremely diverse, though most of them have a peculiar *habitus*, which at once marks them as members of this family. Some observations may be of interest to such of our Eastern brethren who have never had an opportunity to study them in life, and in this hope I offer the following notes:

*Edrotes ventricosus* Lec. Taken at Barstow, Cal., under logs, August 19th. Rare. *E. globosus* Casey is found about the roots of weeds in the middle of May at Greeley, Col.

*Triorophus laevis* Lec. was taken at Barstow clinging to the under surface of boards which were resting on the sand, August 19th. *Trimitys pruinosus* with *E. globosus*, Greeley, Col.

The species of *Eurymetopon* and *Emmenastes* have all very nearly the same habits so far as I observed, being found chiefly about the roots of various plants, especially such weeds as grow in thick clumps or brushes. Most *Emmenastes* have a very fine bluish "bloom" when living, but this is easily removed, and I never saw a cabinet specimen that showed it. These remarks apply particularly to *Eu. rufipes*, *emarginatum* and *convexicolle*, and *Em. ater*, *acutus*, *obesus* and a *n. sp.*

*Epitragus* is not so strictly terrestrial as the preceding insects, and is in the habit of climbing up the sage-brush and resting among the leaves, especially in cloudy weather. I noticed large numbers of *E. canaliculatus* in the branches of sage-brush at Seligman, Ariz., one very rainy and disagreeable day in late July. *E. acutus* I took at Albuquerque; *E. plumbeus* at Coolidge, both having the climbing habit.

*Batulius setosus* may be found in the sand under dry cow-droppings along the Little Colorado River near Holbrook, Ariz., in company with *Aphodius*. It is an "early bird," appearing in April.

*Zopherus* probably breeds in wood, and my series is interesting as showing the replacement of one species by another at short intervals. At Albuquerque I found *Z. granicollis*, and took it again at Coolidge, one hundred and thirty-six miles farther west. Another one hundred and fifty miles, and it gives place to *Z. elegans*; ninety miles beyond this is replaced by *Z. opacus*, which in turn yields to *gracilis* and *tristis* in the next one hundred miles. They all occur in the immediate vicinity of pine logs, generally resting on the bark of the under surface close to the ground, with the exception of *Z. elegans*, which I took around cottonwoods, there being no pine within several miles, except the ties on the railroad.

*Phellopsis* var. *porcata* is found on old pine logs, and is very hard to see on account of its brownish color and the peculiar irregularities of the upper surface, which harmonize with the bark of the tree.

The little *Aracoschizus costipennis* is sometimes seen clinging to the underside of boards laid in the sand along the Little Colorado River bottom. Its congener, *A. armatus*, I found living with a large species of ant at Green River, Wyoming, in May. They are rapid runners, but feign death if disturbed.

In the Colorado desert, near the Needles, Cal., we find *Cryptoglossa verrucosa*, a very fine insect. During the heat of the day it

remains in concealment under logs, etc., but in the evening may be found running over the ground. I took quite a number of them under some bales of straw which had been left on the river's bank-by railroad hands.

*Microschatia inæqualis*, is said to be a common species, but I took only one example, at San Diego, under a log.

*Asida* and its allies furnish a large number of species, some of them very common, and many extremely variable. *Ologlyptus anastomosis* is an interesting form, and is found under logs in the valley of the Little Colorado, in July. *Asida opaca* I took at Albuquerque in clumps of weeds; it lies hidden in the sand at the roots. *A. sordida* was very common at Luna, N. M., and Winslow, Ariz., under logs or at the roots of plants. It is crepuscular in habit and may be seen running around about dark. At Peach Springs I got a few *A. actiuosa*, under logs, with three examples of *A. parallela*, late in August. One specimen of *A. confluens* occurred at the Needles on August 21st. *A. convexa* is rather common in New Mexico in August and September, and shows considerable variation in the width of thorax and elytral sculpture. *A. convexicollis* Lec. is another variable species, and the differences between specimens taken at 7000 and at 5000 feet altitude is considerable. In the former the thorax is much broader, the margin wider and more strongly punctured, the disc of the elytra (taken together) more arched, and the surface more coarsely rugose. I should like to consider them as distinct species in fact, but Mr. Linell, to whom I sent specimens, thinks them the same. *A. marginata* may be found around the roots of plants in August and September with the var. *rimata*. They seem to prefer the immediate vicinity of the river, the latter variety being sometimes seen among the rubbish between the banks of the river's bed. My specimens are mostly from Winslow. *A. elata* is found with it.

The species of *Coniontis* seem to be more distinctively Northern and Western, as I took none in New Mexico nor Arizona. Farther North *C. obesa* may be found as far East as Green River, Wyoming, and Helena, Mon., under rubbish of various sorts. *C. opaca* occurred at Barstow, Cal., and Victoria, Vanc. I., *C. affinis* in eastern Oregon, and *C. ovalis* at San Diego. Of these *opaca* and *ovalis* were often found near the sea-shore, though not confined to it. Other species were taken at Spokane Falls and North Yakima, but are not yet named.

*Cælus ciliatus* may be found close to the sea, under rubbish along the beach. I got only dead specimens at San Diego, in August, and do not know when it may be found alive.

*Eusattus reticulatus*, *Eu. difficilis* and *Eu. muricatus* may all be found around the roots of bushes in sandy places during July and August in New Mexico and Arizona.

*Eleodes*, with its numerous species, is a genus very characteristic of the West. They are known as "circus-bugs" among the Americans of New Mexico, on account, probably, of the antics they cut if startled when running. Try to pick one up and it elevates the abdomen as much as possible, nearly standing on its head to do so. Then, if you insist on touching it, you have to take the consequences. Some of the species eject an offensive fluid from the anus in a fine stream, but in others it seems to simply exude in a drop which adheres to the tip of the abdomen until wiped off. They are so quick that it is almost impossible to pick one up when it is aroused without the insect managing to bring the tip of the abdomen against the fingers. The fluid is much more offensive and caustic in some species than others, and often causes a burning sensation when it touches the skin. I think that *E. longicollis* has the most pungent secretion of any known to me. *E. dispersa* Lec. is one of the commoner species at Coolidge, N. Mex., in June, and may often be seen at the entrances of the burrows of the prairie dogs. When pairing it may be seen in numbers in patches of sand where the bushes are less numerous, running about in the day-time or copulating in slightly sheltered spots. A hundred miles farther west it gives place to the variety *sulcipennis*, which I have never seen in companies at pairing time. *E. suturalis* I never took west of Albuquerque, where it is rather rare. *E. tricostata* is common and lives chiefly at the roots of plants in company with *obsoleta* and *extricata*; with them is sometimes found *E. humeralis*. In California we find *E. quadricollis* under logs and on the border of the Colorado desert. I got a few *E. armata*, a fine species. *E. longicollis* is widely distributed through New Mexico, Arizona, Colorado, Wyoming and the adjacent regions. It varies in sometimes having the elytra rougher than the typical forms, which are nearly smooth. *E. gracilis* is rather rare, and may be found running around in the evening on the eastern slope of the Sierra Madre Mountains and on the Puerco divide from June to August. *E. nigrina* is rather common in the mountains around Flagstaff, Ariz., and *E. hispilabris* is found over an immense extent of territory. *E. caudifera* is abundant in the valley of the Little Colorado, close to the river; *E. pilosa* rare in the Sierra Madre, and *E. hirsuta* in the southern end of Idaho. I got a few specimens of *E. planipennis* in the Sierra Madre in June, and two or three in the mountains

near Williams, Ariz., but never found it in the valleys. *Eleodes cordata* is a common Northern species, and *E. pimelioides* extends as far East as Green River, Wyo. *E. opaca* has the same range (as far as my experience goes) as *E. planipennis*, and seems to be a montane species. *E. fusiformis*, a curiously-shaped species, occurred only at Coolidge and Albuquerque, and is rare.

The next genus, *Embaphion*, is remarkable for having the sides of the thorax and elytra more or less explanate and reflexed, as in *Scaphinotus*, among the Carabidæ. Of the species I have seen this character is most strongly marked in *E. muricatum*, which occurs in Nebraska, Dakota, Montana and Colorado, from May to August. It seems to be rare, at least I got only about half a dozen specimens on my last trip. *E. depressum* and *elongatum* are found at various points in New Mexico and Arizona from April to September. They are provided with a secretion something like that of *Eleodes*, but which leaves a reddish stain on the hand when soap and water is applied, instead of a yellow or brown stain as in the latter genus. *Trogloclerus costatus* is a remarkable insect which I have taken in the vicinity of cottonwoods at Winslow, Ariz.; and Green River, Wyoming.

*Eulabis pubescens* may be found along the sea-shore at San Diego under logs and boards in company with *Amphidora nigropilosa*, and an occasional *Cratidus osculans*. The last species also occurs at Los Angeles, so it is not confined to the immediate neighborhood of the coast.

One specimen of *Argoporis costipennis* was taken near Peach Springs, Ariz., under an old cowhide in August. I never met with another example.

*Iphthimus serratus* is a well-known Northern species, and infests the pine, living beneath the bark of dead trees. In Arizona it is represented by the variety *sublævis*, which has the same habits. My specimens are from the vicinity of Williams at an altitude of about 7000 feet. It does not occur in the plains where the pine trees are lacking. *Cælocnemis punctata* (a nearly smooth variety) is found with it, while at Winslow and east into New Mexico a rougher form extends. *Upis ceramboides* I took under the bark of cottonwood at Glendin, Mont., with a few specimens of *Nyctobates pennsylvanica*. At the Needles I took a new *Alæphus* under a board. *Mecysmus angustatus* flew to my light at Winslow, Ariz. The species of *Blapstinus* have habits so similar to one another that the description of one will do for all. They are found under pieces of wood or dry dung, among dead leaves or beneath rubbish of any sort, and some

species may be found at any points in the West. *Conibius* and *Notibius* have much the same habits, but are rarer. *Ulus crassus* I took under rubbish near Los Angeles.

*Cnemeplatia sericea* is a curious insect, reminding one somewhat of *Heterocerus*. I took one specimen at Holbrook, Ariz., and one at Albuquerque, N. Mex., the latter was flying in the evening, the former I think I took from beneath a piece of board, but can find no note relating to it. A still more curious little animal is *Alandes singularis*, of which I got a few specimens from an ant's nest at Huntington, Oreg., about the end of May. The nest was under a stone in a grassy spot, and with the ants were about a dozen of these *Alandes*. They are curious little things, very strongly punctured, with setose elytra, and an immoderately deep quadrate basal thoracic impression, matching a similar one at the base of the elytra.

While tearing up an old pine log at Victoria in company with a friend, we found a large colony of *Pthora americana* Horn, a little insect resembling our *Diædus punctatus* in appearance. The wood was completely rotten, so that it could be easily be broken up with the aid of a heavy knife, and the beetles were found all through it instead of just under the bark. *Cynæus depressus* is found in pine at Williams, Ariz., just beneath the bark.

Under the sea-weed along Colorado beach were plenty of *Phaleria rotundata* sharing their ill-smelling feast with *Cercyon*, *Saprinus* and numerous Staphylinidæ. *Platydemia janus* Fab. is found under the bark of cottonwood at East Bridge, Ariz., and *P. oregonense* under pine bark from Cœur d'Alene, Idaho, to Coolidge, N. Mex., with *Hypophlæus substriatus*.

*Helops* is found under sticks and rubbish, especially along the river bottoms early in the spring. *H. attenuatus* occurred in the Sierra Madre Mountains. *H. arizonensis* and two undetermined species along the little Colorado, and *H. pernitens* at Portland, Oreg. Other species occur in Western Wyoming.

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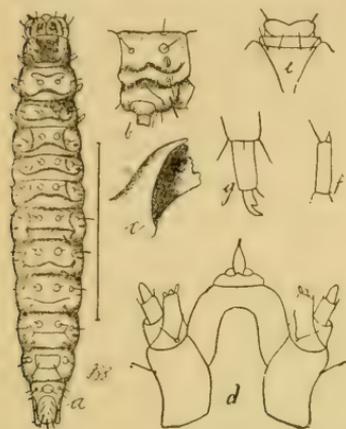
## A NEW SPECIES OF BOTIS.

BY JOHN B. SMITH.

During the summer of 1889 I received from Mr. J. T. Brakeley, of Bordentown, N. J., some buds, flowers, seed capsules, as well as leaf and flower stems of the Egyptian Lotus all badly damaged by a lepidopterous larva. Mr. Brakeley informed me that in the earlier stages the larvæ fed exposed upon the leaves, but soon bored into

the stems, buds or seed capsules, evincing a special fondness for the latter. The specimens received by me were nearly full grown, pupated in a very few days and the resulting moths were declared by "authority" as a new species generally confused with *Botis penitalis*. I published a short account of the species in "Garden and Forest" Feb. 19, 1890, under the name *Botis nelumbialis*, of which I now offer a description:

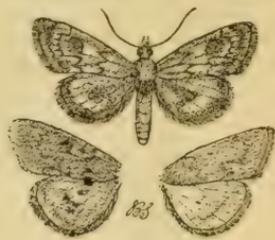
**Botis nelumbialis** n. sp.—Ground color varying from a pale, clear luteous to a ferruginous reddish luteous, powdery, all the intervening shades being recognizable. Head, palpi and thorax concolorous. Primaries with t. a. line single, upright, with three subequal outward angulations. T. p. line



*a*, larva from above; *b*, single segment from side; *c*, mandible; *d*, maxilla and palpi; *e*, clypeus; *f*, antennæ; *g*, leg, enlarged.

single, dusky, widely bent over the cell and there dentate or serrate, then with a long incurve on vein 2, and an outward angulation on the submedian interspace. Beyond the t. p. line is a broad dusky shade outwardly tolerably even, inwardly irregular. Fringes dusky. An indefinite dusky blotch in the cell beyond the t. a. line indicates the orbicular, and a much larger vague blotch beyond the end of the cell indicates the reniform. These markings may be all completely and clearly present, or all save the transverse lines may be obsolete, or on the other hand the markings may be obscure and vague, yet all traceable. Secondaries paler, thinner, somewhat glistening. A variably distinct outer band, dusky in color, and an extra discal, dentate, transverse line not attaining either margin. A variably distinct discal spot. Beneath the color is more whitish, primaries with an outer line more or less indefinite, a vague dusky blotch beyond the cell, and apical region dusky. Secondaries with the maculation of upper side more faintly reproduced. Expands .87—1.12 inches; 22—28 mm.

This species has a little the appearance of *B. penitalis* Grt., and has been confused with that species. The variable characters are in the ground color, in the size, and in the distinctness of maculation. A small, fully marked specimen might easily be taken as distinct from the larger forms in which the markings are either not defined, or obscured by powdery atoms.



*Botis nelumbialis* and varieties.

*Description of Mature Larva.*

Length 21 mm. = .84 inch. General color dirty white, often with a reddish brown tinge on dorsum, sometimes forming two broad brownish bands. Head luteous, smooth shining, sparsely set with hair, maculate with small red-brown dots which sometimes cover nearly the entire head, but more usually make a triangular blotch on the vertex and a lateral oblique band. The cervical shield is like the head, and is similarly maculate with brown. Sometimes the markings are faint and scarcely noticeable, and sometimes they form a distinct central mark with margins of shield also brown. The following segments to the 12th have each four obvious smooth piliferous spots, scarcely tubercles, each bearing a single hair. They are all on the anterior part of the segment, one on each side of the middle, the other just above the stigmata. On segments 8 to 11 are two small, smooth dots, bearing each a single hair on the posterior part of the segment. Segment 12 has a smooth square in the centre bearing two hairs, and a round, smooth spot each side. Segment 13 is like 12, save that the spots are much reduced, and there is an oval anal shield, the posterior edge of which is roughened. The legs are whitish, prolegs with a complete circle of hooks. In general form the larva is slightly depressed, and at first sight resembles a noctuid more nearly than a pyralid.

The larva spins a rather flattened cocoon of a quite dense texture inside the stem and changes to a blackish brown pupa about .56 inches = 14 mm. in length. The pupa is quite slender compared with the larva, the wing cases long, the abdominal segments transversely wrinkled.

The duration of the pupa stage is short, not exceeding ten days and probably less.

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On the occasion of a collecting trip to the sea-shore by Mr. Schwarz, Mr. Wenzel and ye editor, Mr. Wenzel suggested that it might be a good idea in order to promote good feeling and social intercourse among the collectors of New York, Philadelphia and intermediate points, to arrange for a field meeting at some central point. The suggestion was well received, and at a recent meeting of the Feltman Collecting Social of Philadelphia, ye editor was requested to present the matter to the Brooklyn Entomological Society and to the Newark Entomological Society. The latter society at their last meeting in February acted upon the suggestion, appointing Mr. Machesney and ye editor a committee to confer with committees from the other societies, and to arrange the necessary details. The Brooklyn Entomological Society, likewise took favorable action at their March meeting, appointing Mr. Roberts and ye editor as the committee. The Feltman Club appointed as its representatives Messrs. Wenzel and Dr. Castle. In an informal way the committee has considered dates and localities, the former being rather definitely set as July 4th, while the locality is still somewhat indefinite. It is the desire of the committee to get together at this field meeting as many of the entomologists and collectors as possible, in order that they may become personally acquainted, and all, whether members of the Societies named or not, are heartily invited to join. Full particulars will be published in the June number of ENT. AMER. and "Ent. News."

## NEW CALIFORNIA HOMOPTERA.

BY E. P. VAN DUZEE.

(Continued from p. 80, vol. vi.)

### 9. *Thamnotettix atropunctata* n. sp.

Form of the preceding, but smaller. Color bright fulvous brown; head black tinged with rufous, especially on the front. Head, pronotum and scutellum with twelve black dots, arranged, two on the vertex, a row of eight on the anterior margin of the pronotum and on the disc of the scutellum two. Basal angles of the scutellum with a black spot. Length 3.5 mm., female.

Head a little wider than the pronotum, obtusely angled before. Vertex about one-half longer at the middle than next the eye, with an impressed central line, obsolete before the apex. Front slightly widened above the antennæ, the sides feebly convex toward the tip. Clypeus broad, a very little widened apically, the sides straight; apex rounded in conformity to the curve of the cheeks. Loræ large. Cheeks wide, the sides feebly arcuated, beneath the eyes not at all angled. Entire head and the scutellum punctured, the apical field of the latter more coarsely so. Sides of the pronotum rounded, disc obsoletely rugulose and uneven.

Color: Vertex pale yellow, suffused with rufous, especially toward the apex, where there is a brown cloud, interrupted on the medial line; near the posterior margin are two oval black spots, placed midway between the impressed central line and the eyes, and a small brown point adjacent to each ocellus. Face pale rufous, apex and an ill-defined longitudinal line on the middle of the front paler; sutures and a row of short transverse lines on each side of the front brown; below the eyes an indistinct brownish cloud occupies the disc of the cheeks. Pronotum fulvous brown tinged with purple before; anterior submargin with a row of eight distinct black points, the two on either side of the central pair slightly advanced beyond the line of the others. An oval spot within each basal angle of the scutellum, two dots on the disc, and the transverse line black; anterior field pale, posterior obscure rufous. Elytra bright fulvous brown with strong coppery reflections produced by the highly iridescent wings beneath; nervures distinct, pale, marked with whitish where they intercept the pale sutural nervure; costal nervure pale nearly to the apex. Wings smoky, nervures brown. Legs and beneath testaceous brown; abdomen suffused with rufous; darker on the disc; pygofers and edge of the last ventral segment pale, the former shaded with rufous brown toward the apex; ovipositor rufous; spines of the posterior tibiæ pale.

Ultimate ventral segment nearly twice the length of the preceding; lateral angles somewhat obtusely produced; each side of the center is a narrow incision reaching to the middle of the disc, leaving a square central tooth, which is minutely emarginate at its apex. Pygofers broad, with a few stout spines near the suture, arranged in a double row.

Described from a single female (No. 630). This may prove but a variety of the preceding, but the dissimilar coloring and the form of the last ventral segment would seem to entitle it to specific distinction.

**10. *Thamnotettix limbata* n. sp.**

Above dark brown; costal margin of the elytra and all beneath yellow. Vertex produced, subacute. Length 5 mm., male.

Head a very little wider than the pronotum. Vertex flat, its length equal to its breadth on the hind margin, and scarcely less than the length of the pronotum; before produced to a subacute point; passage to the front rounded. Front slightly reflexed above, almost encroaching on the disc of the vertex before; ocelli placed at about one-third the distance from the eye to the tip of the vertex and well up on the anterior rounded edge of the head, distinctly visible on the margin of the vertex when viewed from above. Sides of the front almost straight. Clypeus broad, rounded at the extremity, a little constricted near the base. Loræ long, of moderate width. Cheeks narrow, sides nearly straight, a little waved below the eyes, exterior to the loræ very narrow. Elytra long and narrow; costa feebly convex, costal area with several supernumerary transverse nervures near the apex.

Color: Head pale yellow; front embrowned, a few transverse arcs above and the central line, pale; vertex washed with brown, before the posterior margin with two short oblique lines placed near the eyes and an abbreviated central impressed line, darker brown, eyes black. Pronotum clear pale brown, darker on the anterior margin, where there are some irregular pale lines forming an annulus behind each eye and leaving two brown points on a pale area at the apex. Scutellum brown, darker than the pronotum. Elytra blackish brown; broad costal margin bright sulphur-yellow, before the apical areoles with three or four small hyaline cells formed by a few extra transverse nervures; discal nervures pale brown, paler toward the apex on the yellow costal area concolorous. Wings smoky iridescent, with brown nervures. Beneath clear yellow; dot at the base of the tibial spines and apex of the tarsal joint blackish. Abdomen black, narrow margin of the tergum and the venter yellow; plates with an abbreviated blackish central line at base, the tips infuscated.

Genital pieces: Valve very short and broad, apical margin a very little convex; plates long, gradually narrowed to the apex; margin heavily fringed with long white hairs, especially toward the base; submargin with a row of about ten stout spines; apex of the pygofers with a dense cluster of similar, but larger spines.

Described from a single male example (No. 612). In general form this insect has much the appearance of a small *Tettigonia*, while in the position of the ocelli it approaches *Acocephalus*. It appears to sustain about the same relationship to *Thamnotettix* as does the genus *Anoterostemma* L. to *Athysanus*, but the former genera are perhaps less widely differentiated than the latter.

**11. *Allygus inscriptus* n. sp.**

Broad oval, or almost oblong. Pale testaceous, more or less tinged with yellowish on the vertex, irrorate with darker on the thorax; elytra clouded with fulvous; marked with whitish on some of the basal areoles and transversely banded with the same color near the middle, the fulvous areas sparingly inscribed. Length 4—5 mm.

Head scarcely narrower than the pronotum. Vertex bluntly triangular, about two-thirds the length of the pronotum, the apex obtusely rounded;

surface with a slight transverse depression before the tip. This depression and an impressed line from it to the hind margin are marked with pale brown, and six dots are faintly indicated, two just behind the apex, two smaller ones on either side of these and two faint ones behind the hind margin near the eyes, some or all of which may be obsolete. Face broad, obtuse; cheeks very obtusely angled below the eyes; front truncate ovate, at least twice as broad at the ocelli as at the clypeus; the latter widened toward the tip, which is obtusely triangular, and extends a little beyond the loræ; loræ broad, together almost circular in form; cheeks barely surpassing the loræ. Face whitish testaceous, tinged with yellowish on the front; sutures of the loræ embrowned.

Pronotum broadly rounded before, truncate behind; sides very short, the latero-posterior margin reaching almost to the eye; lateral angles rounded. Surface obscurely irrorate or mottled, darker on the disc; beneath whitish. Scutellum about as long as the pronotum; the basal angles and a transverse impressed line dusky or brown; the narrow edge more or less distinctly alternated with brown and white. Elytra whitish hyaline, paler toward the apex; broadly clouded with fulvous from near the base to the middle, and from beyond the middle nearly to the apex, leaving a central transverse whitish band; tip of the clavus dark brown; nervures brown, on the costa and apex margined with the same color; apex with a submarginal dusky band; discal areoles on the clavus and corium sparingly inscribed with brown within the fulvous areas. Wings pale smoky hyaline, iridescent. Legs white with black points at the base of the tibial spines. Venter pale, somewhat blackish toward the base and on the connexivum; terminal segment about the width of the preceding, truncate, the two edges parallel. Valve very short-triangular, about the length of the last ventral segment. Plates together a little longer than broad; their sides fringed with long pale bristles.

Described from two males (No. 222). A third male (No. 259) differs from the others in being larger, with a shorter, obtusely rounded vertex, the markings on which are darker; on the front a double series of transverse lines and the sutures are brown; the elytra are paler with the fulvous areas much reduced, leaving the transverse band but feebly contrasted. It is not impossible that individuals may yet be taken connecting this species with *Athysanus irrorellus* Stal, but the present material cannot be referred to Stal's species without doing violence to any reasonable interpretation of his description or of the specific characters known to obtain here.

This is a true *Allygus*, agreeing with *A. mixtus* Germ. in all important characters, and is the only North American species of this genus known to me. *Jassus irroratus* Say and its numerous allies have but one connecting nervure between the branches of the first and second sector on the elytra, and belong to *Phlepsius* Fieber. This apparently trivial, and not infrequently variable character, seems almost inadequate for use in separating groups of genera, but correlated as it is with other structural peculiarities of which it is the most pronounced, it appears to answer well the purpose of its em-

ployment, and is much used by Fieber and other European entomologists in synoptical arrangements of the genera.

**12. *Platymetopus elegans* n. sp.**

Form of *P. acutus*. Cinereous; beneath and a broad dorsal stripe from the middle of the vertex to the tip of the clavus pale yellow. Length 5 mm., female.

Head narrower than the pronotum; length of the vertex about one-half greater than its width between the eyes; sides of the narrow front broadly waved, contracted at the antennæ, a little widened below and again narrowed to the apex. Clypeus long, narrowed at base, widened at the rounded apex, which distinctly surpasses the cheeks. Loræ long, at their greatest breadth a little wider than the apex of the front. Cheeks broad, triangular, almost covering the propleuræ. Pronotum a little longer than in *acutus*, three-fifths the length of the vertex; the angles prominent, obtuse. Elytra a little narrowed toward the apex, not so wide as in *P. acutus*, the costal area with about eight strong transverse nervures. Rostrum reaching the base of the intermediate trochanters.

Color: Vertex cinereous before, yellow on the posterior disc; cinereous portion crossed by three longitudinal yellowish white vittæ, distinguished from the disc by slender brown lines; the central vitta begins at the tip of the vertex, where it is distinct, and loses itself posteriorly in the yellow disc between the lateral vittæ; these lay adjoining the central vitta and become obsolete before attaining the apex; close to each eye is an elongated whitish spot, more or less obvious; margin of the head with a double slender fuscous line leaving the extreme edge pale. Face yellow, pale below, with a broad cinereous band on the base of the front, on the lower or apical edge of which is a V-shaped white line edged with blackish. Ocelli fulvous. Eyes rufous, bordered behind with pale. Antennæ white, setæ brown; pronotum yellow, slightly discolored on the disc by the black mesonotum beneath; sides with two broad cinereous bands behind each eye, edged with a blackish line and separated from each other and from the blackish lateral margin by narrow stripes of the yellow ground color. Exposed surface of the propleura, the meso- and meta-pleura outwardly, and the entire scutellum sulphur-yellow; sternum and legs soiled white; tip of the tibiæ and the tarsal joints embrowned, the tibial spines inserted in black points; claws black. Elytra pale brownish cinereous, subhyaline; broad costal margin and two or three obscure, irregular, transverse bands on the corium whitish hyaline; clavus, excepting an obscure cinereous cloud along the outer basal margin pale yellow; surface of the clavus and disc of the corium irregularly sprinkled with obscure pale rufous dots and blotches; cinereous areas sparingly and very minutely inscribed with fuscous; transverse costal and apical nervures and some spots on the discal nervures dark brown, heavy; apical submargin with a brown band. Venter pale testaceous, inclined to cinereous in spots, and marked more or less broadly with black on the base of the connexivum; apex of the pygofers and an area on the posterior margin of the ultimate ventral segment also black.

Last ventral segment moderately long, with an obscure central carina; posterior margin broadly rounded, with a minute central notch.

Described from a single female example (No. 610). This species shows no indications of the oval white or hyaline clytral spots

found in our other American species of *Platymetopius*, and seems to be a very distinct form.

**13. *Deltocephalus coquilletti* n. sp.**

Form nearly of *D. debilis* Uhl., but somewhat broader, with a shorter vertex. Black, head and pronotum with four transverse white or fulvous bands; elytra with as many oblique or transverse white lines. Length; male, 4 mm.; female, 5 mm.

Head a little wider than the pronotum. Vertex flat, sharply, but bluntly angled before; length at the center equal to three-fifths of the width on the hind margin, and three-quarters the length of the pronotum; passage to the front subacute. Face broad, front narrow, occupying hardly more than one-half the space between the eyes, moderately narrowed toward the apex; sides constricted opposite the antennæ. Ocelli situated a little less than one-half way from the eye to the apex of the head. Clypeus narrow, sides straight, or nearly so, apex rounded. Loræ long, about as wide as the clypeus. Cheeks broad, well angled below the eyes, very narrow beyond the loræ. Pronotum short and broad, almost oblong; anterior margin feebly rounded, posterior straight; sides long, viewed from above almost straight, the angle to the posterior margin well rounded; the latero-posterior margins not distinct from the sides. Scutellum broad, almost as long as the pronotum, closely punctured. Elytra broad, apex truncated; longitudinal nervures distinct, transverse obscured by the white lines. First apical areole of the wing broad on the base. Face, legs and entire lower surface finely and closely punctured.

Color dark brown or black; vertex, pronotum and clavus polished black; scutellum dull. Anterior and posterior margins of the vertex and a transverse band on the disc of the pronotum, obsolete before reaching the sides, fulvous; lateral and posterior margins of the pronotum broadly white; medial line of the scutellum, two dots anteriorly on the disc, and two marginal ones before the apex, fulvous; ocelli bright fulvous; face deep black with a broad transverse fulvous band on the middle, curved to correspond very nearly with the superior edge. Legs, tergum and all beneath deep black; anterior and intermediate tibiæ and tarsi, apex of the posterior coxæ and the genitalia, brown; outer edges of all the tibiæ and their spines soiled white, the abdominal segments narrowly margined with the same color. Antennæ black; setæ brown, pale at base. Elytra dark brown; clavus, basal areole of the corium and margin of all the nervures as far as the apical areoles, black; nervures, except at the apex, white; a broad band on the apex of the basal areole extended posteriorly along the inner sector, another on the base of the antiapical areoles, the claval nervures broadly and the apical margin narrowly, ivory-white. Wings deep smoky, hyaline; iridescent; nervures, slender, fuscous.

Genital pieces.—Male: valve broad, triangular, apex rounded; plates broad, convex, together semicircular in form, fringed with soft white hairs, the submargin with a row of stout bristles; on the disc, near the apex, there is, in some examples, a small pale spot.

Female.—Last ventral segment one and a half times as long as the preceding, narrow and compressed on the sides so as to inclose the base of the pygofer, the apex feebly concave across its whole width; pygofer long

and rather narrow, the inner margin and apex narrowly pale and sparsely covered with short bristles.

Described from three males and two females (No. 611). The number of brown marks beneath and the extent of the white bands above is subject to some variation. It is with pleasure that I dedicate this large and striking species to the well-known scientist who has been instrumental in bringing to our knowledge this and many other rare and interesting insects.

**14. *Deltocephalus minutus* n. sp.**

Above pale greenish yellow; vertex with two oblique fulvous spots on the disc; tergum and all beneath deep black. Length 2.25 mm.

Head a little wider than the pronotum; anterior edge well rounded. Vertex almost as long as the pronotum; anterior angle obtuse, surface a little sloping. Front short and broad, transversely convex, its length and breadth subequal. Clypeus about two-thirds the length of the front, regularly narrowed to the apex, margin almost rectilinear. Loræ small, extending about two-thirds the length of the clypeus. Cheeks wide, strongly angled just below the eyes; margin beyond the loræ broad, reaching the apex of the clypeus. Anterior margin of the pronotum strongly rounded, hind margin feebly, angularly, concave; sides very short; latero-posterior margins straight and oblique, the angles obtuse. Scutellum small. Elytra longer than the abdomen, narrow, the costal margin but feebly convex; apical areoles large.

Color: Vertex including the fore margin to before the ocelli, yellow; posterior disc with two approximate oblique fulvous spots which diverge anteriorly; apex sometimes with two minute black points. Eyes and ocelli black. Face deep black; outer angles of the cheeks below the eyes, two small points on the base of the clypeus, another at the outer edge of the loræ, and in some examples faint indications of the transverse lines on the front, yellow. Base of the rostrum pale. Antennæ brown, apex of the first joint pale. Pronotum pale yellow, sometimes tinged with green; anterior margin slightly uneven. Elytra whitish hyaline, tinged more or less strongly with greenish yellow toward the base. Nervures pale yellow. Wings hyaline, feebly iridescent; nervures pale brown, inconspicuous. Legs testaceous brown; femora and some dots on the posterior tibiæ black. Abdomen black; edge of the connexivum and posterior margin of the last dorsal segment yellow; inner edge and apex of the plates testaceous.

Genital pieces.—Male: Last ventral segment rather deeply concave. Valve broad and short, apical margin obtusely triangular. Plates triangular, their apex produced, the submargin with a few short bristles. Styles extended beyond the tip of the plates, toward their apex fringed with numerous stout bristles. Pygofers short, below thickly covered with short white hairs, above and toward the apex with stout dusky bristles.

Described from three males (No. 610); females unknown to me. This minute species bears a marked resemblance to *D. melzheimerii* Fitch, than which it is almost one-half smaller. It still more closely resembles specimens of *D. minkii* Fieber, collected in Quebec, and kindly furnished me by M. L'Abbe Provancher. The fulvous markings on the vertex are variable in extent as is the number of pale spots on the face.

## SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 69, vol. vi.)

### **PACHYTA** Serville.

Prothorax acutely armed at the sides; eyes moderate, feebly emarginate; tibial spurs terminal as usual. The species may be separated as follows:

- Elytra slightly tapered, maculate, nearly rounded at tip . . . **monticola**.  
Elytra strongly narrowed behind, testaceous, maculate or black, feebly truncate and dehiscent . . . **litorata**.  
Elytra strongly narrowed behind, truncate and subbidentate at tip, posterior half of side margin black, reaching suture at tip . . . **armata**.  
Elytra subparallel, subæneous with narrow transverse band wavy, tip rounded . . . **rugipennis**.  
Elytra subparallel, testaceous, truncate at tip . . . **spurca**.

**P. monticola** Rand. Bost. Jour. II, p. 27. Lec. Agass. L. Sup. p. 235, t 8, f. 12, a. b.

Length 9 mm. = .36 in. *Habitat*.—Maine, Mass., N. Y., Can., L. S., Anticosti.

Black, elytra finely and densely pubescent, testaceous with tip and four black spots, nearly confluent along a line near the suture.

**P. litorata** Kirby, Fn. Bor. Am., IV, 1837. p. 178; Mann. Bull. Mosc. 1852, II, p. 367; *nitens*, Lec. l. c. p. 235; J. A. P. ser. 2, I, p. 319.

Length 15—18 mm. = .60—.72 in. *Hab*.—L. Sup., Col., Vt., Mich., Id., N. Mex., Wy., W. T., Alaska, Vanc.

Black, elytra coarsely and confluent punctured, glabrous, humeri prominent, testaceous, vaguely or decidedly quadrimaculate with black or entirely black. Antennæ short and very stout ♀, or about half the length of body and more slender ♂.

**P. armata** Lec., S. M. C., No. 264, 1873, p. 207.

Length 16—19 mm. = .64—.76 in. *Hab*.—W. T., Or., Id.

Black, elytra punctured as in preceding, humeri prominent and disc very convex behind the base, testaceous with black space extending from suture at tip obliquely to the middle of the margin. Antennæ, ♀, half as long; ♂, nearly as long as body.

**P. rugipennis** Lec. l. c. (Newn. ms.).

Length 13—16 mm. = .51—.64 in. *Hab*.—Can.

Black, subæneous, antennæ, femora and base of tibiæ ferruginous. The sculpture of the elytra consists of a reticulation of smooth, strongly elevated lines with the depressed spaces coarsely punctured; from the punctures proceed rather coarse golden hairs. Antennæ: ♂, two-thirds as long as body; ♀, shorter.

**P. spurca** Lec. Ent. Rept., 1857, p. 63; *cervinus* Walker, Nat. Vanc., 1866, II, p. 332.

Length 23 mm. = .92 in. *Hab.*—Cal., Vanc., Nev.

Testaceous, elytra rather coarsely punctured and with faint traces of costæ, fairly pubescent, each with a small dusky spot at the middle near the margin. Antennæ: ♂, as long as body; ♀, shorter.

**ANTHOPHILAX** LeConte.

*Synoptic Table by Dr. George H. Horn.*

Antennæ slender, third joint much longer than fourth.

Elytra coarsely punctate scabrous, more or less metallic.

Elytra greenish blue; legs black . . . . . **viridis** ♀.

Elytra cupreo-æneous to blue; legs pale . . . . . **malachiticus** ♂.

Elytra testaceous, irregularly maculate with piceous spots.

Surface coarsely sparsely punctate, and with small spaces which are distinctly pubescent; median line of thorax distinctly impressed.

**attenuatus.**

Antennæ stouter, third and fourth joints short, stout and nearly equal in length.

Elytra impunctate, dull velvety red, scutellar region and apex black.

**mirificus** ♂.

Elytra coarsely punctate, scabrous at basal half, abruptly smoother at apical half; wholly black . . . . . **mirificus** ♀.

Elytra coarsely not closely punctate at basal half, abruptly smoother at apical half; wholly black . . . . . **tenebrosus** ♀.

Thorax convex in *tenebrosus*, broadly longitudinally sulcate in *mirificus* ♀ and ♂. I suspect that *viridis* and *malachiticus* are sexes of one species.—GEO. H. HORN.

**A. viridis** Lec. Agass. L. Sup. p. 236, J. A. P. ser. 2, 1, p. 326.

Length ———. *Hab.*—Lake Sup., Mich.

**A. malachiticus** Hald., Trans. Am. Phil. x, 1847, p. 64; Lec. J. A. P. ser. 2, 1, p. 326; *cyaneus*. Hald., Proc. Ac. Phil. iii, p. 151.

Length 13 mm. = .52 in. *Hab.*—Somerset Co., Pa.; Lake Sup., Mich., Can., Mass.

**A. attenuatus** Hald., Trans. Am. Phil. x 1847, p. 59; Lec. Agass. L. Sup., p. 235; J. A. P. 2, 1, p. 319.

Length 14 mm. = .56 in. *Hab.*—Eagle Harbor, Lake Sup., N. B., S.W. Virginia.

**A. mirificus** Bland, Proc. Ent. Soc., 1865, p. 382; *venustus* Bland, l. c. ♀.

Length 14—19 mm. = .56—.75 in. *Hab.*—Col., Id.

**A. tenebrosus** Lec. S. M. C., No. 264, 1873, p. 208.

Length 12 mm. = .48 in. *Hab.*—S. E. Cal.

The species of *Anthophilax* seem to be very rare in collections, and I regret that the genus is very poorly represented in my own.

## On the Habits of *Phlæophagus* and *Stenoscelis*.

BY FRANK H. CHITTENDEN.

Our two native species of *Phlæophagus* live in the dead wood of various deciduous trees, sometimes occurring together and frequently also in company with a closely related species, *Stenoscelis brevis* Boh. My observations would indicate that the three species are of nearly identical habits. The mature insects pass a considerable portion of their existence in the mines which they excavate in wood, seldom appearing abroad or on the wing, and it is owing to their habits that these somewhat common beetles are seldom taken by collectors in any numbers.

Small round holes resembling pin-holes made by the adult *Phlæophagi* in their egress from their living quarters may frequently be seen thickly scattered over the dead, bare portions of a variety of trees. The similar, larger holes of *Stenoscelis brvis* are usually to be found in the same situations. It may be worth while to mention that I have always observed these species in the dead portions of living trees, or in the upright trunks of dead trees and only in parts that had been denuded of bark. I have never taken them from logs or the smaller branches of trees, and have never known an instance of their boring through or living under bark.

The larvæ occur with the imagines, and though the two genera occur together, it is not difficult to separate them. The pupal stage is doubtless, of brief duration, as I have never succeeded in securing a single specimen.

*Phlæophagus apionides* Horn was observed on a dead birch tree in July, and both larvæ and beetles occurred in April in a stump of wild black cherry (*Prunus serotina*).

*P. minor* Horn I have found in greater abundance than the above. It was taken from birch, willow and elm wood in July and November. Both species have been cut from ash by Mr. William Jülich (*Ent. Amer.* vol. iv, p. 35).

*P. spadix* Hbst., an imported species, was found on the sea-beach by Mr. Jülich (l. c.) in water-soaked pine drift wood.

*Stenoscelis brevis* Boh. is more common than any of the above. I have observed it on the following trees: basswood, beech, birch, butternut, elm, maple, sycamore, willow and European linden. Specimens were taken from the wood in October, November, December, January, May and July, and were found abroad in the last two months crawling about on the infested trees.

## SOCIETY NEWS.

BROOKLYN ENTOMOLOGICAL SOCIETY.—Meeting March 4th. Present Prof. John B. Smith in the chair and seventy-five persons. Minutes of the last meeting, the Treasurer's report for February, and the report of the Librarian were read and approved. The appropriation of \$150 for the support of the ENTOMOLOGICA AMERICANA for 1890, by the council of the Institute under certain conditions, was referred to the Executive Committee for report. Messrs. J. B. Smith and C. H. Roberts were appointed a committee to confer with committees from the Newark and Philadelphia Entomological Societies as to date of a joint field meeting of the members of the several societies during the coming season. Messrs. Rodrigues Ottolengui, of 486 Vanderbilt Avenue, Brooklyn, and Martin H. Wilckens, of 261 Henry Street, Brooklyn, members of the Institute, were elected to membership in the Society. The exchange of the ENTOMOLOGICA AMERICANA with the "Entomological News" was approved.

Mr. Zabriskie exhibited male and female of the *Diomorus Zabriskii* Cress., a hymenopterous parasite on the bee, *Ceratina dupla* Say, and the wasp *Crabro stirpicola* Pack., together with enlarged diagrams showing the structure of the external organs. This parasite is the only recorded species of its genus in this country, and had been only seen by him on two occasions when reared from nests of the above hosts in stems of cultivated Black Raspberry.

Mr. Hulst spoke at length upon "the Phycitidæ of North America," illustrating his remarks by charts and black-board sketches of structure. He first gave a history of the family from the time of Linnaeus to the present. He then explained what a Phycitid was, showing how the family was separated structurally from the rest of the Lepidoptera.

A description was then given of the eggs and of the larvæ and their habits, some of which infest berries, others flour, meal, canned and dried fruits; some are twig borers, other live in silken cocoons among leaves. One has the remarkable habit of living upon bark lice, and was the first known instance of a North American caterpillar having that habit.

After this the imago was taken up, and the structure of all the organs was explained in detail. Mr. Hulst took the ground that the bitufted maxillary palpi which some of the males have, allied them very closely to the Epipaschiidæ. He also showed that the structure of the ♂ genitalia separated them into two distinct groups.

Mr. Hulst afterwards exhibited his collection of North American Phycitidæ, in which are found the original types of nearly half the known species, and typical specimens of a large proportion of the rest.

The meeting adjourned after an explanation of a number of stereopticon views by Prof. Smith.

A. C. WEEKS,

*Recording Secretary.*

# ENTOMOLOGICA AMERICANA

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No. 6.

## THE BLACK PEACH APHIS.

A new species of the genus *Aphis*.

By ERWIN F. SMITH, Sc. D., Washington, D. C.

### *Aphis persicæ-niger* n. sp.

WINGED VIVIPAROUS FEMALE (*pseudogyna migrans*).—Antennæ as long as the body, sometimes a little longer or shorter, black or dark brown, borne on widely separate, inconspicuous tubercles, joints imbricated, vi and vii conspicuously so, the seventh always a little longer than the third; iii, 0.45—0.56 mm.; iv, 0.33—0.40 mm.; v, 0.20—0.29 mm.; vi, 0.09—0.11 mm.; vii, 0.47—0.61 mm.; sensoria rather large (0.01—0.02 mm.) ringed and distinct, numerous and very protuberant, giving to the under surface of the antennæ a strongly tuberculate, almost serrate character, about 40 on iii in three irregular rows, about 20 on iv in two rows, 5 or 6 on v in one row, and a group (4—6) on the rather broad distal end of vi, one of them longer than the others. Beak 0.69—0.96 mm., usually not much more than reaching to the second pair of coxæ. Thorax arched with a conspicuous button-like tubercle between the wings, black shining. Legs parti-colored; tarsi and tips of tibiæ (distal one-fourth or one-fifth) black or dark brown, coxæ and distal portion of femora (two-thirds, more or less) also dark, the rest pale or yellowish; femora smooth, or nearly so; tibiæ rather evenly and strongly spined beneath; tarsi 0.127 mm. Wings hyaline, slightly iridescent, no dusky patches or bands, stigma pale, rather broad (0.15 mm.). Abdomen somewhat constricted at junction with thorax, rounded behind and rather compact, seldom much longer than broad, slightly margined; dorsum smooth, black and shining throughout, or sometimes bordered with brown, never roughened, tuberculate, mealy, or punctate; venter uniform black or dark coffee-brown, no green or greenish markings. Cornicles twice the length of the tarsi and nearly three times the length of the style (0.25 mm. in most individuals), truncate and distinctly flanged, largest at the base (0.07 mm.) and tapering gradually to the apex (0.04 mm. under the flange), sometimes narrower at the base and slightly expanded in the middle, but never clavate, black or dark brown, smooth or indistinctly imbricate, opaque or translucent. Style not cone shaped, but very blunt rounded, nearly as long as broad (0.09 mm. X 0.11 mm.) and always a little shorter than the tarsi, provided with a few long

pale bristles, and thickly set with short dark scales, which change toward the apex into short, spreading, papillose setæ. Anal plates not smooth, but imbricate like the style and bearing a fringe of long pale bristles. Body smooth, rather thick set and compact; length 1.96 mm. to 2.09 mm.; breadth wing to wing 6.54 mm. to 7.25 mm.; wing 2.73 mm. to 3.18 mm.

April to June. Leaves and twigs of the peach.

APTEROUS VIVIPAROUS FEMALE (*pseudogyna fundatrix?* and *pseudogyna gemmans*).—Antennæ variable, usually about two-thirds the length of the body, black or dark brown, set on widely separate, inconspicuous, frontal tubercles; joints not tuberculate, vii almost always shorter than iii; no sensoria on iii or iv, one on distal end of v, and a group on the expanded distal end of vi. Beak reaching to second pair of coxæ and sometimes beyond, but not to third pair, except in immature specimens (0.53 mm. to 0.82 mm.). Thorax broad and flat, gradually widening posteriorly and blending with the very broad abdomen into a smooth and shining black plate, in which the separate segments are indistinguishable. Abdomen margined, broader than long, rounded behind, so that the insect is broad wedge form, sometimes almost cordate, especially when distended with pseudova. Abdominal segments distinct beneath, but usually only the last 2—3 visible above; venter, and sometimes border of dorsum, dark coffee-brown, the rest very black and shining, as if lacquered; sometimes a row of pits or depressions along the margins, corresponding to the stigmata, dorsum not otherwise pitted and free from hairs, tubercles, or mealliness. Length of body 1.64 mm. to 2.38 mm.; breadth\* 1.00 mm. to 1.50 mm.

In all other particulars like the winged form. The young are a uniform pale yellow or weak-coffee color, becoming darker with each moult. The insect bears no green or greenish markings at any stage of development.

January to December. All parts of the peach tree above ground and below. Commonest upon the branches from early spring to midsummer, but also observed in autumn and twice in midwinter (January, 1889, and January and February, 1890). Can be found upon the roots almost always at any time of year.

*Habitat.*—Virginia (!), Maryland (!), Delaware (!), New Jersey, Michigan (!).

Very abundant and destructive along the Atlantic coast, but rare in the West, as if recently introduced.

This aphid has been known to peach growers for more than twenty years, but does not appear to have been critically studied by any one. It has been identified with *Myzus persicæ* (Sulzer), which it does not resemble, and with *Myzus cerasi* (Fab.), which it resembles only superficially. Prof. Uhler thought it agreed most nearly with Koch's description of *A. chrysanthemi*, and in my first account of the insect\* I followed his judgment, not having seen the winged

\* *Peach Yellows: A preliminary Report*, U. S. Dept. of Agric. 1889.

form. Further study with abundant material has convinced me that it is distinct from *A. cardui* Linn., to which *A. chrysanthemi* Koch. has been reduced. So far as I have been able to observe during four seasons spent in the orchards, this aphid is confined exclusively to the peach. I have never found it on the roots or tops of orchard weeds, or even in neighboring cherry orchards. *Myzus cerasi* differs from it in half a dozen important particulars, *e. g.* Antennæ set on conspicuous frontal tubercles, gibbous on inner face, and only about one-half as far apart, joints not tuberculate, except iii, which is only slightly so; less than one-half as many sensoria on iii, five in one row only, none on iv, one on v; stigma narrower; no button-like tubercle on back of thorax; femora more inclined to be hairy; cornicles cylindrical and twice as long; style longer and distinctly cone-shaped. In the apterous form the dorsum is also minutely punctate throughout, like shagreen.

This insect is an *Aphis* rather than a *Myzus*, belonging most properly, I think, to that section of the genus classed by Prof. Oestlund as *Aphis nectarophorini*.

Among peach growers it is generally known as "the black aphid." It may, therefore, appropriately bear the name of *Aphis persicæ-niger*, especially since all the mature forms yet discovered are *shining* as well as black.

(To be continued.)

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Mr. Liebeck, in "Entomological News" No. 4, gives an interesting account of how he makes use of a white dog to attract Coleoptera in early evening. A collector of no mean standing tells of a still more effective method which accident disclosed to him. It is his practice to take a stroll through the fields with his wife on summer evenings, and usually his beating net accompanies him. One evening, returning from a stroll, a light rain induced the lady, to protect the makeup of her hair, to turn up her skirt over her head, exposing the white petticoat. Soon our friend's attention was attracted by numerous black spots on this white surface, and investigation showed that they were Coleoptera, which were promptly bottled, and many of which proved good things. Of course it is not absolutely necessary that the white surface should be either a dog or a petticoat, but in default of anything better, either will answer as an attraction.

## SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 98, vol. vi.)

### ACMÆOPS LeConte.

In the preparation of the following table and notes I have received much assistance from Dr. Geo. H. Horn; both in permission to examine his sets of the variable species (twenty species, of several of which no two are exactly alike), and by his experience as to the characters which are trustworthy in separating such. And I am indebted to Mr. Samuel Henshaw for numerous additions to the lists of localities. It is to be noted in this connection that many Western species which reach South to New Mexico, are there found among the mountains where the elevation causes climatic influences similar to their customary Northern habitat.

This genus contains a number of species of moderate size, in which the head is not at all, or only moderately constricted behind in *lisa*. Dr. LeConte indicated three groups. The last, containing only *pratensis*, is abundantly distinct by the very long mouth and front. The first has its characters most fully developed in *bivittata*, viz.: a short, stout form, tarsi short and stout, the first joint scarcely as long as the next two combined, short antennæ, the joints almost serrate, and the third and fourth joints neither as long as the fifth. The tarsal joints are densely clothed beneath with short pubescence, which on each joint is equally dense. The second group contains more slender species, the antennal joints longer and more slender, and the tarsal joints longer (especially the first) and unequally clothed beneath, most of the species having the dense pubescence confined to the third joint. *A. directa* represents the group, except that the first tarsal joint is abnormally long. This second group also contains those species which have a flattened thorax and most nearly resemble *Leptura*. The form of the prothorax varies considerably, being either decidedly angulated, or very indistinctly angulated, or rounded on the disc. In *discoidea* and *proteus* it is strongly flattened and channeled, with edges slightly prolonged and elevated each side. Many of the species are liable to great variations in color, which have been heretofore described as species, but are now considered unworthy to rank even as varieties, the various forms blending insensibly into one another. Following Dr. LeConte's paper, S. M. C. No. 264, 1873, I have prepared this

### Synopsis.

Group I.—Short stout species; hind tarsal joints stout, equally pubescent beneath; antennæ stout, except in *thoracica*.

A.—Prothorax with lateral angle distinct, sides behind the middle concave.

Black, prothorax yellow, densely pubescent, elytra densely punctured.

**thoracica.**

Color variable, very slightly pubescent, elytra sparsely punctured.

**bivittata.**

Blackish blue, scarcely pubescent, elytra coarsely and distantly punctured.

**atra.**

Greenish bronze, pubescent, elytra coarsely and sparsely punctured, general form less stout, and lateral angle of thorax more rounded.

**subænea.**

B.—Prothorax with lateral angle rounded, not prominent, sides parallel behind.

Testaceous, feebly pubescent; punctures of elytra irregular towards base.

**pinguis.**

Dark metallic blue, black or bronze; pubescence yellowish, soft and long.

**tumida.**

Black, elytra violet blue; pubescence short, black, erect . . . . . **viola.**

Group II.—Slender species; hind tarsal joints slender, last joint only usually densely pubescent beneath and more broadly bilobed; antennæ slender.

A.—Disc of prothorax convex, slightly channeled and densely punctured.

Prothorax longer than wide; first and third hind tarsal joints densely pubescent beneath, second wholly or partly bare.

Elytra more sparsely punctured, pubescence very short and sparse; elytra black, vittate more or less with testaceous, or wholly testaceous.

Sides of head parallel behind the eyes . . . . . **longicornis.**

Sides of head oblique behind the eyes.

Prothorax more densely punctured . . . . . **vincta.**

Prothorax shining, less densely punctured . . . . . **ligata.**

Elytra more densely punctured with short pubescence; black, with the base more or less red . . . . . **basalis.**

Prothorax wider than long; hind tarsi with third joint only densely pubescent beneath.

Hind angles of prothorax not prominent; pubescence sparse; elytra black, varying to testaceous, or with red humeral angle. **militaris.**

Hind angles of prothorax prominent; elytra black, varying to fuscous, clothed with soft, long pubescence . . . . . **subpilosa.**

B.—Disc of prothorax convex, coarsely punctured, lateral angle prominent; antennæ stouter, third and fourth joints together not longer than fifth; elytra very deeply punctured.

Black; head, scape of antennæ, elytra and legs rufotestaceous. **lisa** n. sp.

C.—Disc of prothorax convex, not channeled, sparsely and finely punctured, elytra rounded at tip.

Sides of head behind the eyes straight, oblique, neck concave.

Testaceous; elytra coarsely punctured with suture, dorsal vitta and side margin black . . . . . **directa**.  
Sides of head behind the eyes tumid, rounded, smooth; prothorax more deeply constricted behind.

Black, with fine hoary pubescence, mouth and prothorax ferruginous. **falsa**.

D.—Disc of prothorax flattened behind and prolonged each side into a tubercle; elytra truncate at tip.

Prothoracic tubercles conical lateral; black, elytra opaque, base and side margin and sometimes the suture bright red . . . **discoidea**.

Prothoracic tubercles dorsal, obtusely rounded; black, elytra shining, more distinctly punctured, black, striped, testaceous or fuscous. **proteus**.

Group III.—A moderately stout small species; the front and mouth extremely long; antennæ inserted in front of the line joining the anterior margin of the eyes; prothorax campanulate, constricted in front, wider and feebly constricted behind; elytra truncate at tip.

Black, elytra black, fuscous, or testaceous, sometimes with a dorsal vitta and tip fuscous . . . . . **pratensis**.

**Bibliography, etc.**

**A. thoracica** Hald., Trans. Am. Phil. 1847, x, p. 60; *sulcicollis* Dej., Cat. third edition, p. 381.

Length 8 mm. = .32 inch. *Hab.*—Pa., Mass., Va.

This species resembles the next in appearance, and seems to be rare in collections. I am unable to say to what extent it varies in color. Mr. Bland has described a form of this species under the name *incerta* with the base of the tibiæ yellow.

**A. bivittata** Say, J. A. P. 1823, III, p. 416; *nigripennis* Lec., J. A. P. ser. 2, I, 1850, p. 323; *varians* Lec., l. c., p. 324; *fusciceps* Lec., l. c., p. 324.

Length 6—9 mm. = .24—.36 inch. *Hab.*—N. Y., N. H., Ill., Ia., Wis., Dak., Neb., Mo., Kans., Col., N. C.

The typical form of this insect has the elytra yellow, with two black vittæ, while the thorax and legs may be either yellow, or more or less black. The form *nigripennis* has black elytra, with thorax more or less yellow. The form *varians* is entirely black, and *fusciceps* is entirely testaceous, except the dusky head. While there can be no doubt of the specific identity of all these forms, it may be well to retain some names for convenience in exchanging.

**A. atra** Lec., l. c. 1850, p. 323.

Length 8 mm. = .32 inch. *Hab.*—Oreg., Wash., Nev., Idaho.

The coarse, sparsely-placed punctuation of the elytra, and very sparse pubescence, make this a very distinctive species.

**A. subænea** Lec., l. c. 1850, p. 101.

Length 9 mm. = .36 inch. *Hab.*—Cal.

This species is grouped with the preceding in the table, the outline of prothorax behind the tubercle being decidedly concave, but the tubercle itself is very nearly rounded, and the insect resembles the following species in form. The color and coarser punctuation will, however, distinguish it from *subpilosa*, its nearest cousin, in the next group.

**A. pinguis** Lec., S. M. C. No. 264, 1873, p. 210.

Length 9 mm. = .36 inch. *Hab.*—Cal.

“The punctures of the basal half of the elytra are arranged so as to give the appearance of faint longitudinal stripes, of which the inner one runs obliquely forward towards the humerus, so as to tend to unite with the others” (LeConte).

This species is at present represented by a unique in Dr. Horn's collection.

**A. tumida** Lec., Ent. Rept. 1857, p. 63; *lugens* Lec., l. c.; *fusca* Lec., l. c.; *californica* Lec., J. A. P. ser. 2, I, p. 101; *subcyanea* Lec., Ent. Rept. p. 63; *mollipilosa* Lec., Proc. Ac. Phil. 1860, p. 321.

Length 7—12 mm. = .28—.48 inch. *Hab.*—Oreg., Col., Nev., Cal.

This species varies in color from black, partly or wholly fuscous or testaceous to blue, and also considerably in the amount of pubescence. The forms described by Dr. LeConte are inseparable and were all referred by him, in 1873, to *tumida*. The name it will be noted is not the earliest, but the most descriptive.

**A. viola** Lec., Proc. Ac. Phil. 1860, p. 321; Horn, Trans. A. E. S. xii, 1885, p. 180.

Length 11 mm. = .43 inch. *Hab.*—Oreg., Cal., Nev.

Similar to *tumida*, but differs as follows: “color violet-blue, legs and antennæ black, surface clothed with short, black, erect hair. The elytra are more densely punctate, and the thorax rather less so than in *tumida*” (Horn).

**A. longicornis** Kby., 1837, Fn. Bor. Am. p. 185; Lec., J. A. P. ser. 2, I, p. 321.

Length 9—11 mm. = .36—.44 inch. *Hab.*—Cal., Col., Wash., Oreg., “65°” (Kirby).

Elytra usually black vittate with yellow; legs yellow or black. Varies all black, or all testaceous, suture black, or as in *marginalis* (Lec., Ent. Rept. p. 28), elytra testaceous, margin black.

**A. vincta** Lec., Proc. Ac. Phil. 1861, p. 346.

Length 12—13 mm. = .47—.53 inch. *Hab.*—Cal., Oreg., Utah, Neb.

Closely resembles preceding in form, color and variations. Differs by head being oblique behind the eyes, hind impression of prothorax deeper and general form less robust.

**A. ligata** Lec., 1873, S. M. C. No. 264, p. 211.

Length 8—12 mm. = .32—.48 inch. *Hab.*—Mont., Wash., Col., Ks., Mo.

Closely allied to the preceding, but is distinguished from *longicornis* by less robust form and shape of head, and from both *vincta* and *longicornis* by the prothorax being less densely punctured, more shining and more constricted, especially at the base.

I am of the opinion that the three last-named species—*longicornis*, *vincta* and *ligata*, should be united under the oldest name, viz.: *longicornis* Kirby. I have quoted the characters given by Dr. LeConte for their separation, and I think the possessor of large series of either species will find them all in his set.

**A. basalis** Lec., 1873, S. M. C. No. 264, p. 211.

Length 10—11 mm. = .40—.44 inch. *Hab.*—Cal., Wash., Nev.

A slender species, proportioned somewhat like *longicornis*, but with the elytra more flattened and more densely punctured. The head is gradually narrowed behind the eyes, as usual, but is very distinctly constricted, though not strongly at base. The elytra vary somewhat in color, being often lighter, but the red color at base is always distinct on the umbones.

**A. directa** Newm., 1842, Entom. p. 71; 4-*vittata* Linn. (fide Hald.); *vittata* Sweder Vet. Ac. Nya Handl. 1787, viii, p. 198; Hald., Trans. Am. Phil. x, p. 65; 4-*vittata* Schön., Syn. Ins. i, p. 497; *pallida* Hald., l. c. p. 65.

Length 6—8 mm. = .24—.32 inch. *Hab.*—Pa., N. J., Vt., N. Y., Md., Ga., Ala., Ohio.

**A. militaris** Lec., J. A. P. ser. 2, i, 1850, p. 322.

Length 7—9 mm. = .28—.32 inch. *Hab.*—Or., Wash., Cal., Idaho.

Dr. LeConte describes this species as "black, with rather long ashy pubescence with a small red humeral spot." This form appears to be rather rare, and that usually met with is without the red spot and sparsely pubescent. It is often entirely black, but varies in color like the following, from which it may be known by the less slender form, particularly of the thorax.

**A. subpilosa** Lec., l. c.; *lupina* Lec., Proc. Ac. Phil. xii, 1860, p. 321; *dorsalis* Lec., Col. of Kansas 1859, p. 21.

Length 9—11 mm. = .36—.44 inch. *Hab.*—Wash., Oreg., Cal., Wyo., Mont., Utah, Kans., Rocky Mts.

Black, vittate with, or entirely testaceous; pubescence long and soft.

**A. lisa** n. sp.

Length 8 mm. = .32 inch. *Hab.*—Wash.

One specimen sent to Dr. Horn and marked by him "evidently

new." The head is more strongly constricted behind than in any other *Acmecops*, but the general fascies is similar to the slender species like *longicornis*. Eyes deeply emarginate, head and mouth parts and first two joints of antennæ rufo-testaceous; prothorax black, constricted in front, strongly angulated at sides and hind angles prominent, but not produced, longer than wide; densely, not coarsely punctured, a small smooth space on disc near base. Elytra nearly parallel, very coarsely, almost confluent punctured at base, less coarsely at tip, which is bluntly rounded; rufo-testaceous, clothed with very fine golden pubescence. This pubescence is scarcely perceptible without a strong glass. Legs also rufo-testaceous, hind and middle tarsi and tibiæ and part of femora darker. Hind tarsi, with third joint deeply bilobed and densely pubescent beneath, the first and second joints almost glabrous. Beneath black, except head and center of prosternum.

**A. falsa** Lec., Proc. Ac. Phil. 1859, p. 80.

Length 6—7 mm. = .24—.28 mm. *Hab.*—So. Cal.

I have seen no variation in the color of this species, even in the extensive series in Dr. Horn's collection.

**A. discoidea** Hald., Trans. Am. Phil. x, p. 60; Lec., Agass. L. Sup. p. 235; Dej., Cat. 3 ed. p. 381.

Length 6.5—8 mm. = .26—.32 mm. *Hab.*—L. Sup., Mich., Pa., N. J., N. Y., Mass.

This also is a constant species; the red color may entirely encircle the black on the elytra, but is never more than a narrow edge, and it is never missing at the base.

**A. proteus** Kirby, 1837, l. c., p. 186; *sublineata* Hald., l. c. p. 60.

Length 6—9 mm. = .24—.36 inch. *Hab.*—Pa., L. Sup., Mich., Wash., N. Y., H. B. T.; Col., Or., Wis., Mont., N. Mex., Kans. Can., N. H., Mass., Labrador. "54° 60'" (Kirby).

The coloring varies from black to testaceous in every degree. The form described as *gibbula* by Dr. LeConte differs by the lateral elevations of prothorax being less prominent and cannot be separated from the typical form.

**A. pratensis** Laich, 1784, Verz. Tyr. Ins. ii, p. 172; Muls., Col. Fr. 2d ed. p. 492, and many other descriptions in European publications; *strigilata* Fab., Ent. Syst. i, 2, p. 341; Léc., Agass. L. Sup. p. 325; J. A. P. ser. 2, i, p. 323; *semimarginata* Rand., Bost. Jour. ii, p. 20; *longiceps* Kirby, l. c. p. 187; *fulvipennis* Mann., Bull. Mosc. 1853, iii, p. 251.

Length 6—8.5 mm. = .24—.34 inch. *Hab.*—Kenai, Col., Mont., Mich., "54° 65'" (Kirby), Anticosti, N. Mex., Ks., Or., Me., L. Sup., Vanc., Wyo., Nev.

Varies greatly as indicated in table. The very long mouth and front make this a very remarkable species.

**PIODES** Leconte.

**P. coriacea** Lec. J. A. P. ser. 2, 1 p. 318; Ent. Rept. 1857, p. 62.

Length 19 mm. = .75 in. *Hab.*—Oregon.

Black piceous, somewhat shining, head and thorax very closely rugosely punctate; elytra rugose.

“The whole appearance of this insect is that of a *Prionide*; it differs, however, by its immarginate thorax and conical anterior coxæ. Eyes scarcely prominent, mandibles rather long edentate, antennæ scarcely longer than head and thorax; thorax wider than long, very densely rugosely punctured, dorsal line finely impressed. Elytra twice as wide as thorax and half longer than wide, truncate at base, dilated a little behind the middle, rounded at apex, densely rugose with a few scattered punctures.”

Dr. Horn has kindly called our attention to an error in the bibliography of *Pachyta*, viz.: *P. rugipennis* should read Newn. Zool. ii, p. 476; Lec., etc. (not Lec. Newn. ms.). This had been already pointed out by Dr. Horn (ENT. AM. i, p. 6, and note 14, p. 9), and stands correctly in Henshaw's List.

It should be understood that Dr. Horn's work on *Anthophilax* ends with his signature. There is a good colored figure of *A. mirificus* under the name *Pachyta costaricensis* Bates, Biol. Cent. Am. v, p. 277, pl. xxi, fig. 1.

I am indebted to Mr. Samuel Henshaw for many of the localities above given and following additions to those given in last numbers.

**Agallissus gratus** Hald. (not Lec.), Proc. Ac. 1853, vi, p. 363; N. Mex.

**Atimia confusa** Cal., Mass.

**dorsalis** Guadalupe, Id., S. Cal.

**Distenia undata** R. I., La., S. W. Va., Ga., Tex., Mich.

**Desmocerus palliatus** Can. W., N. Y., Ga., Mo., Wis.

**auripennis** Or.

**Necydalis mellitus** Can. W., N. Y., Ga., Mo., Wis.

**Ulochætes leoninus** Vanc., Ft. Crooke.

**Encyclops cœruleus** Me., N. H., Mass., Pa., Wis.

(To be continued.)

The mosquito is to have a new lease of life! The Lamborn prizes have been awarded to those who most gracefully said that the Dragonflies couldn't master him. We said the same thing long since and got no prize either!

## THREE NEW SPECIES OF COLEOPTERA.

RY J. J. RIVERS.

**Amblychila baroni** n. sp.—Form graceful; above wholly of a subdued resinous black; beneath shining black. Head subquadrate, with two punctures distant from each other and situated just behind the first or clypeal suture; two other punctures are behind the the second or frontal suture, but these punctures are firmer and closer together and nearly central; on the vertex near the eye is a triangle of three punctures. Thorax strongly convex, slightly longer than wide when looked at from above, but exact measurement of the anterior margin, through its great convexity, shows it to be greater than its longitudinal measurement; the side margins narrow from the front to the hind angles, in a gentle curve where they end in a transverse constriction that involves the hind margin, though it is raised above the constriction; the pronotum is produced in the middle on the front margin, and it is extended in the middle of the hind margin; hind angle subacute; a fine longitudinal impressed line, which does not reach either the front or hind margins. Elytra twice as long as wide, convex; flattened upon the central area; a series of well formed imbricated punctures and representing about sixteen broken rows; at the base a few of these imbrications become connected forming a short ridge or keel, while some others have developed into a mucron overhanging a puncture, or else forming a slight elevation between punctures; the whole becoming less asperate towards the apex. The acute margin extends from the basal angle about two-thirds and becomes obsolete; it is formed of a narrow carina slightly interrupted, and it is accompanied on its upper side by a row of fine punctures the acute and real margins are nearly parallel, and the interval between them is ornamented by four rows, much broken, of mucronate punctures like those on the elytra. Length 1.00 inch; 25 mm.

One specimen ♀, found by Mr. Oscar F. Baron, in Pantano County, Arizona, after whom I have great pleasure in naming this insect.

The above insect is certainly not easily confounded with any other North American species; Piccolomini's example is conceded to be a varietal form of Say's *A. cylindriciformis*, and the great size and profuse ornamentation in *A. cylindriciformis* will alone be sufficient to separate it from *A. baroni*.

**Cychrus (Brennus) oreophilus** n. sp.—Form broad, flattish convex, with beautiful outline, prothorax dull black, elytra moderately shining black, beneath shining black. Head proportionate, front nearly smooth, with a well marked depression inside orbital ridge; gena doubly notched. Thorax wider than long, widest across the foremost third, then decreasing sharply and obliquely to the hind margin, which is much contracted between the angles; in the oblique side margin there is, in some examples, the faintest indication of a sinuation; hind margin truncate, angles acute; at the base is a transverse impression, out of which grows a central depressed line reaching near to the front margin. Elytra with thirteen equally formed striae, coarsely punctate

after the style seen in *mimus*, the confused striæ at the sides number about five, and are of a net work pattern; the inflexed portion is smooth with faint punctures; the acute margin is sharply defined and the disc is slightly flattened.

Received from Shingle Springs, Eldorado County, California.

This has been confused with *C. obliquus*, but its less convexity, the finer puncturings and intervals, and the non-interrupted striæ of the elytra, easily distinguish it. The greater width of the thorax in contrast with the narrowness at the hind margin, it having the most oblique side margin of any known *Cychnus*, and still further the black without the least semblance of purple additionally characterize it.

It belongs to group 3, section 13, of Horn's "Synopsis of the Species of *Cychnus* inhabiting Boreal America."\* It should be placed just before *striatus*.

The home of the species is in the Foot-hills of Eldorado Co., California.

***Necydalis barbaræ*** n. sp.—Form large, robust; color chestnut-brown to pitchy-black. Head rugosely punctate and with a well defined frontal channel. Thorax with lateral protuberance, and with two depressions above, dorsal channel nearly obliterated, boldly constricted both before and behind. Elytra flat, finely rugosely punctate, slightly depressed on disc, sutural margins perfect, ending in a slight projection; there is, however, a continuous margin around the apex, which reaches to the humeral angles; tip truncate, not convex, as in the other species. Size 22 mm. = .87 inch.

*Habitat*.—Santa Barbara, Cal. Collected by Oscar F. Baron.

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## A BIT OF HISTORY.

BY PROF. C. H. FERNALD.

In the "North American Entomologist," vol. i, p. 102 (1880), I expressed the desire to have the date of Zeller's *Chilon. et Cramb.*, definitely determined, so that we could know positively whether Walker's or Zeller's species should take precedence. In the same place I published an extract from a letter from Dr. Hagen, giving his reasons for believing that Zeller's paper was published before Walker's work on the Crambidæ.

Early in 1881 I wrote to Prof. Zeller, himself, asking for the date of publication of his work on the Crambidæ, but he did not answer that part of my letter. My copy of Zeller's Crambidæ is one of the separata, and gives no clue to the date beyond the year,

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\* Trans. Am. Ent. Soc. vii, December, 1878.

1863, but Prof. J. B. Smith kindly loaned me his copy for examination, and this contains the rest of the work. So conclusive did the evidence appear that Zeller's paper antedated Walker's, that I published an account of it in ENT. AMER. vol. v, p. 215, along with the correct dates of publication of several of Walker's works.

Mr. Meyrick wrote me soon after that he had seen a copy of Zeller's paper with "ed. July, 1863," on the title page in Zeller's own hand writing. I had previously seen a copy in Berlin with the same words, said to be Zeller's hand writing, but the evidence from Prof. Smith's copy was so conclusive that I felt sure there must be some mistake in the Berlin copy.

In the "Entomologist's Monthly Magazine" for April, 1890, p. 111, Mr. Meyrick has published a note in which he expresses doubts of my conclusions because of the date given in the copy mentioned above. I am free to confess that I felt quite uncertain about the matter when I learned that two copies, at least, contained the same date of publication—July, 1863, but Mr. Stainton has added to the above note of Mr. Meyrick some extracts from letters received from Zeller which settle the matter beyond all doubt. I give here the last two:

"Meseritz, 21st June, 1863.—Next week the printing of my Crambiden will be finished. I am now busy with the Index and list of Errata."

"Meseritz, 21st July, 1863.—Herewith you will receive some separate copies of my Crambiden. The reason for the date of publication being *written* is that the year appears on the title of the 'Schulnachricht,' which remains here."

I hasten to correct the error into which I had fallen, and thank Messrs. Meyrick and Stainton for calling my attention to the matter, and for giving us the real facts in the case. This information is certainly very opportune, for it comes before the issuing of my work on the N. A. Crambidæ.

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Mr. Fletcher has sent us a slip from an Australian paper in which is treated at some length a little *Capsid*, thought to be undescribed, and very injurious to vegetation. Among other characteristics—"when the insect is in repose the antennæ are doubled under the body between the legs, but when piercing the fruit they erect and straighten out the serrated weapons, which are sharp pointed, and exert their strength in piercing the stem or fruit. The attacking antennæ are covered at intervals with a very minute capillary substance, the use of which we are unable at present to define, though it may aid in the process of suction."

## SOME APPARENTLY NEW NOCTUIDÆ IN THE COLLECTION OF THE BRITISH MUSEUM.

BY HENRY EDWARDS.

During my stay in London, two years ago, I was enabled, through the kindness of Mr. A. G. Butler, to examine the large number of Noctuæ and Geometridæ collected some years ago in Southern Oregon and Northern California by Lord Walsingham, and I recognized as entirely new to me, and I believe to science, the following species. I have little doubt that a more lengthened and careful examination than I was able to make would result in the discovery of many other uncharacterized forms, particularly among the Geometridæ and Pyralidæ. Had I returned to London the following year, as it was my intention to do, I should have taken with me some types for comparison, and would have done my best to work up the whole series, but that pleasure has been denied me, and I therefore think it best to place on record the descriptions of those I did examine.

**Herrichia cervina** n. sp. Primaries reddish fawn color, ochreous at the base, with median band of a darker shade, narrow on internal margin, much widening on costa and enclosing the round reniform and subreniform, which are both bordered with ochreous. Behind the median band is a broad paler shade, clouded with darker fawn color and encroached upon by two sharp teeth proceeding from the brown submarginal band. The paler shades are mottled with darker fawn color. Secondaries dusky fawn color, with the fringes of both wings reddish fawn. Thorax and abdomen concolorous. Underside of primaries dusky fawn, costa and margin reddish, with an indistinct median waved line, which is continued on the secondaries, the ground color of which is redder than that of the upper wings. Discal spot distinct. Abdomen, thorax and legs reddish fawn. Exp. wings 20 mm.

Four specimens. Mt. Shasta district.

I place this insect in Mr. Grote's genus, as it appears to me to be, at any rate, very closely allied to it, bearing, as it does, a strong superficial resemblance to the well-known *H. mollissima*.

**Annaphila casta** n. sp. Allied to *A. diva* Gr. Primaries brownish black at the base and for about one-half of the wing, the brown space being mottled with bluish scales. The dark half of the wing is interrupted quite obliquely behind by a broad, clear white band, encroached upon anteriorly in the middle by a small brown point from the brown basal space. Otherwise the anterior edge of the white band is quite even and runs directly from the exterior third of the external margin to the costa. The posterior margin of the band is clouded at the external angle with dusky. In the middle is a large circular brown spot, and a smaller one above it, triangular in shape, representing the reniform and subreniform. The apex of the wing is broadly

filled up with brownish, dotted, as is the base, with bluish scales. The secondaries are clear chalk-white, not creamy, as in *A. diva*. The marginal band is broader and more even on its edges than in that species, and the base of the wing is more densely filled up with black. Beneath the ground color is wholly pure clear white, and not yellowish, as in *A. diva*. On the apical margin of primaries is a heavy blackish patch containing a series of six sagittate, bluish white spots; before this the white band of the upper side is repeated with a small black linear and one roundish discal spot, and then a blackish band widest on costa. The base is white, with a bluish tinge. The secondaries have the marginal band of the upper side repeated with small bluish white patches, while the base is marked by a bluish white cloud, enclosed by black hairs, broadening into a spot on the costa. The thorax above is concolorous with the base of the wings. Abdomen brown at base, becoming gradually white towards the tip, the segments being indicated by narrow white bands. Below, the thorax, abdomen, legs and palpi are clear pure white. Average expanse of *diva*, ten examples, 17 mm.; *casta*, ten examples, 21 mm.

Oregon. Camp No. 9.

There is no doubt as to distinctness of this species. The collection contained many specimens of *A. diva* for comparison, and though resembling each other, it would be impossible to confound the two forms.

***Euclidia annexa*** n. sp.—Primaries slate-brown. A little before the middle begins a brown mark which is remarkably like that in the well-known *E. mi* of Europe. It is almost even on its anterior edge, scarcely touching the internal margin, but there slightly rounded and curving upward into a deep tooth in the middle, broadening along the course of the median nerve and running up to costa, where it is joined by another longitudinally-oblong brown patch not reaching to the internal margin. These patches are bordered by a pale line, and in the larger patch is a distinct black dot. On the costa subapically is a greenish brown patch, and the external margin is also brownish, with a paler anterior shade. The secondaries are dusky slate color, with two very distinct ochreous waved bands, and a patch of the same shade in the middle near the costa, enclosing a brown discal spot. Abdominal margins dusky. Underside wholly pale ochreous, with the margins, two waved bands, and discal marks brownish black. Thorax and abdomen above wholly brown-black, except the tip of the latter, which is ochreous. Beneath wholly ochreous. Expanse of wings 30 mm.

Six specimens, Rouge River, Oregon.

It has been claimed that "sugar" is not attractive to moths in tropical countries, and that quite different bait must be used. Dry codfish and other strong smelling substances are used with success, and recently I learned of quite a novel attraction; it is simply the collector's shirt that he has had on all day when hard at work and which is said to be rather superior to anything else as bait.

## NOTES AND NEWS.

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Such phantastic stories about the prices of rare Lepidoptera spring up at intervals in our entomological contemporaries that a line should be drawn somewhere. I admit that as much as £20 to £30 will be paid in the English markets for an insect, but only when it is a unique and has been so far found but once.

The rarity of *Teinopalpus imperialis* ♀ has been overrated. Within the last two years more than twenty females have been obtained, and the price ranges now from about \$25 to \$40, according to the size and state of the insect. The main collecting ground for it is Tiger Hill, 8500 feet high, southeast of Darjeeling, Himalayas, but lately it has been caught likewise in neighboring districts.

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It is simply wonderful how some of the Lepidoptera are "protected," *i. e.*, protect themselves successfully against the attacks of birds, bats, lizards, etc., by a peculiar odor which they emit. Prominent East Indian collectors: Doherty, Möwis, Hartert and Nicéville, have lately given us many points about it.

Hartert says: "Few people, even among those who have collected in the tropics, know by own experience the pungent smell which many Lepidoptera emit. There is an idea that the smell is only peculiar to the males and serves them for making themselves agreeable to the females. This rule is not without an exception, for among a certain *Delias* of Upper Assam, which was endowed with a very strong musk smell, I found a few smell-bearing females.

Many of the large *Papilios* emit a faint smell of musk, most of the *Elymnias* bear a weak, but pleasant perfume, and the males of *Ornithoptera rhadamanthus* and *ruficollis* carry a faint, unpleasant smell. *Lethe mekara* Moore, of Assam, smells considerably like violets, but the most remarkable instance is given by the extremely rare Hesperian *Calliana pieridoides* ♂, which Doherty and I obtained in a few examples in Assam during October. The strong smell of this beautiful insect excels charmingly any perfume known to me, and reminds one of the aroma of the flowers of Heliotrope. The smell of the males of *Euplwa* is unpleasant to me, but liked by some of my colleagues."

So far Hartert. Doherty wrote me about the same, only adding that the papers in which he had folded *C. pieridoides* retained the pleasant odor for a number of hours after death.

B. NEUMOEGEN.

## PREPARATORY STAGES OF ARCTIA DOCTA Walk.

BY HARRISON G. DYAR.

EGG.—Conoidal, the base flat, smooth and shiny. Color pearly white, or pale yellow. They are not fastened to a surface as is usual, but appear to be laid loosely, perhaps some adhering together. Before hatching, the orange-colored head of the included larva is seen through the transparent shell at the summit of the egg and the black larval hairs curved spirally around it. Duration of this stage eight days.

FIRST LARVAL STAGE.—The head and cervical spot are semi-transparent pale orange, the eyes black. Body pale whitish, with about eight warts per segment, blackish, producing long, white and black hairs. Length 2 mm. Duration of this stage three days.

SECOND LARVAL STAGE.—Head testaceous, but the eyes and jaws brown. The body is similarly colored with the head, but paler, the warts large and blackish, bearing black hairs. Length about 4 mm. Duration of this stage three days.

THIRD LARVAL STAGE.—Head testaceous; the eyes, jaws and two large spots on the vertex, blackish; a few hairs. Body brown, the subdorsal space nearly black, with a pale whitish dorsal line. The black warts produce short black hairs and a few long pale ones. Length of the larva 8 mm. Duration of this stage four days.

FOURTH LARVAL STAGE.—Head black and shining. Body dark brown, nearly black dorsally, leaving a pale, interrupted, dorsal stripe. Warts black, arranged as in the mature larva and producing black hairs, with a few longer, paler ones. Feet black. Length 10 mm. Duration of this stage five days.

FIFTH LARVAL STAGE.—Head black, but paler about mouth and behind the eyes. Palpi pale. Body black, paler on the venter, with an interrupted reddish dorsal line. The abdominal feet are pale, and the spiracles reddish; otherwise as before. Length 15 mm. Duration of this stage eight days.

SIXTH LARVAL STAGE.—Head black, slightly reddish centrally and paler at the sides; the plates above the mouth are whitish; jaws black, and palpi pale, with a black ring, the last joint reddish. Body velvety black with an interrupted dorsal red stripe absent on joints 2, 3, 4 and 13, forming a row of eight red spots, rounded posteriorly and pointed anteriorly. Thoracic feet black; abdominal black with the claspers pale brown. Hairs black, a few longer white ones posteriorly while those from the subventral warts are tawny reddish. The hairs are stiff and spiny, about 5 mm. long and are

not abundant enough to hide the body even just after moulting. There are a few black hairs on the head and a fringe of short hair overhangs it. The warts are large, dull black, and arranged exactly as in the larva of *Arachnis picta* Pack.\* Spiracles white. Length of the larva at maturity 45 mm. Duration of this, the last larval stage, eleven days.

**COCOON.**—A slight netting of threads drawing together any loose material and containing no hairs, for these remain on the cast skin. The operations of forming the cocoon and preparation for pupation occupy five days.

**PUPA.**—When first formed the pupa has the thorax, head and cases pale transparent yellow, the abdomen white, purple between the segments with a brick-red dorsal interrupted line and several rows of darker red spots on the sides and venter. The cremaster is broad, but very short, with four spines of about equal length; color pale brown. Soon the whole pupa turns shining black and becomes covered with a white bloom. Cases creased; thorax and abdominal segments punctured. Duration of this stage twenty-eight days.

**FOOD-PLANTS.**—The larvæ seem to be practically omnivorous, at least for tender plants growing near the ground. I carried some from California to the East and fed them on the native plants by the way. They reached maturity in Florida on the food-plant of *Dilophonota ello*. During all the larval stages they feed only at night, and are very lively in their attempts to run and hide if disturbed. Larvæ from Los Angeles County, Cal.

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### EXCURSION.

The committee from the Brooklyn, Newark and Philadelphia Societies have decided upon Upper Jamesburg, N. J., as the place where the field meeting of the entomologists of the three cities and neighboring points is to take place on the 4th of July next. Jamesburg is on the Amboy Division of the Pennsylvania Railroad, and may be reached from New York *via* Perth Amboy and Rahway at 9.10 a. m., Newark at 9.36 a. m.; *via* Monmouth Junction, New York 7.20 a. m., Newark 7.50 a. m. Leave Philadelphia from Broad Street at 6.50 a. m. *via* Camden at 7.10 a. m.

The 7.20 a. m. from New York *via* Monmouth Junction meets the 6.50 from Philadelphia at Monmouth Junction, and this train is

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\* See Ent. Amer. vol. vi, p. 74.

recommended, as it will bring the party into Jamesburg at the same time. Excursion fare about \$2.10 from New York and Philadelphia. All the entomologists desiring to attend will be heartily welcomed, whether members of the societies organizing the excursion or not, but in order that the necessary arrangements for creature comforts can be made, all those expecting to take part in the field-meeting will please notify one of the members of the committee as soon as convenient. Further information may be obtained from the committee:

Dr. D. M. Castle, 2007 Arch St., Philadelphia.  
C. P. Machesney, 65 Broadway, New York.  
C. H. Roberts, 235 W. 122d St., New York.  
J. B. Smith, Rutgers College, New Brunswick, N. J.  
H. W. Wenzel, 1115 Moore St., Philadelphia.

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### SOCIETY NEWS.

ENTOMOLOGICAL SOCIETY OF WASHINGTON.—March 6, 1890.—Mr. Schwarz exhibited and remarked upon the following species of Coleoptera, which are new to the fauna of North America: *Lathridius* (*Coninomus*) *nodifer* Westwood; *Actinopteryx fucicola* Allibert, *Arrhipis laneri* Guerin and *Probatius unbratilis* Duval. He also showed specimens of *Tenuochila hubbardi* Lèveillé and *Teretriosoma hornii* Lewis, recently described in European journals from the semi-tropical region of Florida. He finally drew attention to Dr. Horn's recent Revision of the North American species of *Ochthebius*, and spoke of the geographical distribution of these aquatic beetles. Discussion followed by various members.

The Secretary presented a note on a Dipterous larva infesting the seeds of Xanthium. He had found these larvæ at Manhattan, Kansas, and during the past winter in the District. Drawings were exhibited illustrating the larva and the nature of its work.

The Secretary also presented a short note on the food-habits of *Psiloptera drummondi*.

These notes were discussed by Schwarz, Townsend and Howard.

Mr. Townsend read a paper entitled "Notes on Acridiidae in Michigan," which related more particularly to dates of appearance and habits.

C. F. MARLATT,  
*Recording Secretary.*

### BROOKLYN ENTOMOLOGICAL SOCIETY.

Meeting April 1, 1890.—Fifty persons present, Rev. George D. Hulst presiding. Minutes of last meeting read and approved. Prof. Smith, of committee to arrange with Philadelphia and Newark Entomological Societies for a joint field meeting, reported that Jamesburg, N. J., on July 4, 1890, had been informally suggested, and that a stated meeting of the several committees would be soon held, at which a determination would be reached. Mr.

L. A. Best, of 125 Sixth Avenue, N. Y., Mr. Henry E. Hallowell, of No. 789 Monroe Street, Brooklyn, and Mr. Frank H. Johnson, of No. 168 Hancock Street, Brooklyn, were elected members of the Department.

Prof. Hooper reported informally that the natural history collections of the late John Calverley had been secured for the Institute through the kindness of his son, Mr. William Calverley, and that the entomological portion of the collection would be placed in charge of this Department—such portion being complete as to nomenclature and North American species in respect to Lepidoptera and Coleoptera to the year 1870, when Mr. Calverley ceased to collect. The Secretary was thereupon directed to express the thanks of the Department to Mr. William Calverley therefor.

Prof. John B. Smith introduced scientific discussion by an explanation of the structure of the anal tuft of *Euchætes egle*, which was arranged upon pleats or folds, following this by remarks on some peculiar and interesting structures of insects assisted by lantern views.

The first series of views represented variation in the head and mouth parts and ovipositors of several species of Diptera, including *Hæmatobia serrata* (imported horn fly, injurious to cattle), *Stomoxys calcitrans*, house fly, and *Eristalis tenax* or drone fly.

The second series represented modifications of the ovipositor as a means of defense as shown in the stings of *Polistes* and *Bombus*, or as a tool for cutting vegetable tissues as shown in the saw-like instruments of the Tenthredinidæ.

The third series indicated the resources of larvæ of limited silk spinning capacity, as those of *Halesidota caryæ* in the construction of their cocoons, by using the hairs with which their bodies were clothed, and which cohered by reason of numerous hooks with which each hair was furnished. A modification of these hairs was shown in the spines of the saddle-back caterpillar, *Empretia stinulea*, which were hollow and tapered to a point, which readily broke off in any substance pierced by them, the fluid secreted at the base of the spine entering the wounds made by them and causing the smarting sensation experienced.

The next series showed portions of the external structure of several species of Coleoptera, including the leg of a *Dytiscus* (the hairs thickly studing the joints resolving themselves under the microscope to filamentary bodies, crowned with flat, circular disks, or suckers, calculated to unite the insect firmly to any desired object) and the star-like punctures of the elytron of *Cupes capitatus*.

The last series represented parasites of the surf-duck, pigeon and cow.

Meeting May 6, 1890.—Twenty persons present, Rev. Geo. D. Hulst presiding. Mr. Lendal V. Hallock, Creedmoor, N. Y., and Dr. Samuel Russell and Mr. George A. Street, Brooklyn, N. Y., were elected members of the Department. The election of officers was taken up and the officers of last year were re-elected save the President and editor, election of which went over until the June meeting. Mr. Weeks read extracts from a pamphlet issued by a dry-goods house in Brooklyn, giving methods of destroying "The Moth, moth miller and moth-fly" as an evidence of the necessity for the dissemination of entomological knowledge.

A. C. WEEKS,

Recording Secretary.

# ENTOMOLOGICA AMERICANA

VOL. VI.

BROOKLYN, JULY, 1890.

No. 7.

## NEW SPECIES OF TÆNIOCAMPINI.

BY JOHN B. SMITH.

Since the publication of my Revision of some of the Tæniocampid genera (Proc. U. S. Nat. Mus. xii, 455-496, 1889-90) a number of species which merit description have come into my hands. It is matter of regret that a monographic work should be so soon made incomplete by describing new species, but there seems to be no help for it in the present state of our science. From the appearance of collections coming in, I believe that fully one-third more than are at present known will be added to our list of *Noctuidæ* in the next five years, and that our lists then will be very much different in arrangement from those at present in use.

**Tæniocampa carminata** sp. nov.—Head and thorax a luteous brown, with a more or less evident carmine washing, most distinct in the female of the specimens before me. Primaries: ground color rather a pale luteous, more or less completely suffused with carmine. In the specimens before me the ground color is faintly visible through the centre of the wing only in the female; in the male all the interspaces up to the terminal space are distinctly luteous, while the latter space and the veins are carmine. The usual maculation is obsolete. Secondaries blackish fuscous with yellow fringes. Beneath yellowish fuscous, with a more or less obvious reddish suffusion. Expands 1.40 inches; 35 mm.

*Hab.*—Colorado (Bruce).

The vestiture is entirely hairy, forming no thoracic tufts. Antennæ of male lengthily bipectinated, of ♀ simple. The primaries have the apex rectangular, the outer margin rounded, and thus the species belongs to the *rufula* group, from which it differs in the distinctly roughened front, which is not, however, protuberant. The species is unique in appearance and unlike any other of our species

in color. Both sexes are before me and other specimens are in collections, all from Mr. Bruce, to whose kindness I owe a number of fine species.

**Tæniocampa curtica** sp. nov.—In color of head, thorax and primaries, varying from a reddish clay color to a distinct red-brown, somewhat powdery. The transverse lines are very variably distinct, sometimes all save the s. t. line indefinite. When present they are as follows: basal line narrow, pale, irregular, without defining margins. T. a. line pale, almost upright, angulated on the veins and there also black marked, else not defined save in the costal space. T. p. line pale, sinuate, of the usual form, outer margin defined by a slightly darker shade, which is emphasized by a series of venular points, behind which are small pale dots. S. t. line always distinct, pale, but slightly irregular, preceded by a distinct darker shade not broken up into spots in the specimens before me. Veins black marked through terminal space. Orbicular concolorous, small, round, indistinctly pale ringed, scarcely definable in some specimens. Reniform moderate in size, constricted centrally, narrowly pale ringed, inferiorly black filled; a dusky shade from costa between the spots, obliquely outward to the blackish filled part of reniform. Secondaries soiled whitish at base, blackish outwardly. Beneath reddish powdery over whitish, with a common black exterior line breaking into dots on secondaries and with a distinct discal spot on each wing. Expands 1.20—1.25 inches; 29—30 mm.

*Hab.*—Sierra Nevada, Cal.

A considerable number of specimens has been before me from Messrs. Edwards and Neumoegen, all agreeing save in distinctness of maculation. The species belongs to the *oviduca* group of the genus, with very decided leanings to the *incincta* type in wing form and maculation. The apices of primaries are rectangular, but scarcely acute or produced, and the prominent s. t. shade recalls *incincta* quite strongly. The antennal pectinations are shorter however, and the wings are less frail; the species as a whole stouter in habitus. The vestiture consists of flattened hair and scales.

**Tæniocampa addenda** sp. nov.—General color of head, thorax and primaries red-brown, adding either a grayish or luteous tint; maculation variably distinct, almost entirely obsolete in one specimen, while in another it is very distinct. In the latter the basal line is marked only by a venular dot; t. a. line outcurved, lunate between veins, darker, preceded by a slightly paler shade. T. p. line very even, slightly sinuately and nearly parallel with the outer margin, consisting of a series of dusky lunules, beyond which is a series of short venular streaks terminating in a pale dot. S. t. line somewhat irregular, marked by a blackish preceding shade, which makes the terminal space seem paler. A series of blackish terminal lunules. The median space is blackish filled below the costal region and the s. t. space is well powdered with blackish. Orbicular small, round, black filled. Reniform moderate, upright, slightly constricted medially, black filled. Secondaries smoky fus-

cous or yellowish, with black powderings. Beneath reddish powdery with common, incomplete exterior line, and discal spot on all wings. From this fully marked form we have the change to an almost uniform reddish or grayish brown with the maculation almost entirely wanting. Expands 1.24—1.32 inches; 31—33 mm.

*Hab.*—California.

Both sexes from Mr. Neumoegen's collection are before me. The species belongs structurally to the *incincta* group, and is allied to *pectinata* and *terminata*, from both of which it differs obviously, most nearly resembling the latter perhaps. The vestiture is hairy, antennal pectinations long. The median lines are quite approximate inferiorly.

***Tæniocampa venata*** sp. nov.—Head, thorax and primaries bright reddish luteous, with more or less evident red-brown shadings, especially noticeable on the veins through the s. t. and terminal spaces. Basal space; powdery median space with a broad, brown shade between the ordinary spots, almost filling the space below. Basal line marked only by venular dots. T. a. line a single, brown line, slightly irregular, outwardly oblique and curved, preceded by an undefined paler, yellowish line. T. p. line darker red-brown, curved over and touching the outer margin of reniform, then evenly incurved below, followed by a paler line and over the cell by venular dashes. S. t. line paler than ground color, irregular, diffuse, indefinite. A dusky terminal line. Orbicular large, round, pale ringed, concolorous. Reniform large, kidney shaped, pale ringed and black filled. Secondaries smoky fuscous with ocher yellow fringes. Beneath reddish, powdery, with incomplete outer line and discal spot on all wings. Expands 1.50 inches; 37 mm.

*Hab.*—New York.

A single male specimen, in good condition, collected by Mr. Bruce, many years ago, and numbered 63. In structural characters this species agrees with *addenda*, but differs both in wing form and maculation. The latter recalls *incerta* quite strongly, but the pectinated antennæ at once separate it. The apices are not as pointed as in *addenda* and the outer margin is less curved. I have never seen anything to match this species, and do not think it can be readily confused with any of the described forms.

#### **PERIGONICA** gen. nov.

Eyes hairy; tibiæ not spinose; form robust; vestiture hairy; thorax with a somewhat indefinite and loose median crest or keel; palpi short, not exceeding front, slightly drooping; antennæ of male serrate and bristled, or pectinated. Wings large, primaries with apices prominent acute, outer margin somewhat excavated to middle, where it forms a distinct angulation.

Habitus of *Tæniocampa* or *Perigrapha*. From both it differs in the wing form, and this is the basis of the genus, which otherwise agrees fairly well with *Tæniocampa*, save in the thoracic crest. *Perigrapha*, which has this crest, has also a different wing form, and has the antennæ uniformly pectinated and longer than in the present genus.

Two species referable to the foregoing generic characterization are before me, agreeing in maculation to a remarkable extent, but differing in antennal structure very decidedly.

*Angulata* is a creamy-gray species in which the male antennæ are serrate and bristled—"brush like."

*Fulminans* is a larger, reddish form, in which the male antennæ are rather lengthily bi-pectinated. It is from Colorado, while *angulata* is from California.

***Perigonica angulata*** sp. nov.—Creamy or luteous gray; head and thorax immaculate. Primaries with basal line evident, geminate; t. a. line geminate, outcurved, somewhat irregular and interrupted. T. p. line sinuate, inner line narrow, somewhat lunulate, followed by two series of venular dots. S. t. line narrow, pale, hardly distinct, nearly parallel with outer margin. A row of not quite terminal black dots. A distinct median shade band from costa between ordinary spots, outwardly oblique and invading the lower part of reniform, there angulate, and then parallel with and close to t. p. line to inner margin. Orbicular concolorous, moderate in size, round, vaguely defined by a slightly paler annulus. Reniform narrow, upright, somewhat constricted centrally, pale margined, inferiorly dark filled. These markings vary in the direction of obsolescence, one specimen before me being nearly immaculate and showing only tracings of the described maculation. Secondaries whitish, with a blackish outer marginal line and a distinct discal spot. Beneath powdery, with a black, complete, common outer line, and a black discal spot on all wings. Expands 1.48 inches; 37 mm.

*Hab.*—Sierra Nevada, Cal.

Both sexes from Mr. Henry Edwards. The variation is in the direction of obsolescence of maculation in the specimens before me: the peculiar double series of venular dots beyond t. p. line and the inception at costa of the median shade being the most permanent features.

***Perigonica fulminans*** sp. nov.—Somewhat luteous brick-red, very even in color. Head and thorax immaculate. Primaries with all the maculation faint, scarcely legible. Basal line traceable, geminate. T. a. line single, narrow, dusky, outwardly curved. T. p. line geminate, sinuate, outer line a series of venular dots. S. t. line rather distinct, slightly irregular, pale, as a whole about parallel with the outer margin. A narrow median shade line from costa between the ordinary spots, outwardly oblique to and darkening the lower part of reniform, there angulated and then parallel with and close

to t. p. line to hind margin. Orbicular moderate, concolorous, barely distinguishable by a faintly paler annulus. Reniform narrow, upright, medially constricted, annulate in pale, the inferior portion darkened by the median shade. Secondaries whitish, semi-transparent, with a dusky outer border. Beneath powdery, with an outer common line and discal spot on all wings. Expands 1.52—1.64 inches; 38—41 mm.

*Hab.*—Colorado.

Both sexes, collected by Mr. Bruce, in Mr. Neumoegen's collection and coll. Rutgers College. The specimens before me are nearly identical in color and markings, but judging from its ally I am persuaded that forms will be found in which the maculation will be as distinct as in *angulata*, and then the description of that species will answer for the present as well, so far as ornamentation is concerned. It is matter of interest that two species so nearly alike in color, wing form and habitus generally should differ so strongly in antennal structure.

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For mounting small specimens of Coleoptera, triangles or arms of gelatine will be found greatly superior to those made of cardboard. The thin plates or sheets of gelatine used by photographers are very nice and even, and very cheap. They are rather thin, but two of them glued together make a good thickness. These triangles are so transparent as to be almost invisible, and specimens mounted thereon with Le Page's liquid glue will adhere readily and permanently. What is wanted now is a cheap punch that will cut the triangles neatly and of a regular and uniform size.

Santa Rosa, Cal.

L. E. RICKSECKER.

Mr. Ricksecker's note is interesting, and he kindly sent me a sample of the gelatine plates. I found that they cut splendidly with a punch, and that the pins pierced easily and held tightly. I found also that the points curled in the sun and that they drooped when exposed to moisture. In cutting points I select a medium cardboard and use punches of two sizes, but cutting the same length. The best punches I have seen do not make a clean cut, and even with a perfect scissors it is almost impossible to make a fine point that has not a right and wrong side. Mr. Wenzel has the best arrangement I have seen. He gets strips of card-board of uniform width, and, on a block of boxwood, cuts with a razor. This works rapidly, and the cut is clean and smooth, even the most slender point being absolutely true and without curl. Mr. Ricksecker's points look pretty, and if the gelatine could be made to repel moisture, they would be perfect.—ED.

## ERISTALIS TENAX IN ENGLAND.

BY A. G. BUTLER.

In the May number of ENTOMOLOGICA AMERICANA Dr. Hamilton has an interesting article on the Pollenization of Chrysanthemums by this fly, and he appears to think that it confines its attentions to the flowers of these plants. In England *Eristalis tenax* is more attracted by the large annual Sunflowers and double Marigolds than by other flowers, but it certainly visits other flowers. Its resemblance to a honey-bee probably affords it a degree of protection, as some birds are undoubtedly suspicious of it; but, as the Buntings, including the American Nonpareil and Indigo-finch, the English Robin, Nightingale and Missel-thrush, the White-eared Bulbul and Leiothrix, seize and eat it without hesitation, there can be no doubt that very many are destroyed by insectivorous birds. I grow Marigolds partly for the purpose of attracting these flies, which I turn into my aviaries, and thus during September my birds get a considerable amount of insect food, which they would otherwise have to dispense with.

\* \* \* \*

Apropos to Dr. Hamilton's article in No. 5, of ENT. AMER., it may be of interest to know that I took scores (and could have taken hundreds) of specimens of *Eristalis tenax* on a patch of wild mustard growing in this county some ten miles back from the lake last September and October. I have specimens in my cabinet that I took in California in August. The fall flowers here on the prairie, wild mustard, the different asters and golden rods, and the large Compositæ are always attractive to *E. tenax*, as I have noticed for many years.

O. S. WESTCOTT.

*Additional Note.*—It may be well to add that *Eristalis tenax* has been quite common in New York State for years past, occurring in early Spring, and more abundantly in the Fall, not only on Chrysanthemums, but on nearly every species of flower, both cultivated and wild, in bloom at these seasons. On account of the abundance of Compositæ at the time of its occurrence the fly is most often to be found on these flowers, but I am not inclined to believe that it is in any manner restricted to this order of plants. I have frequently noticed these flies flying about in the sun when the weather was so chilly that no other living insect was to be found abroad.

F. H. C.

## THE GENUS DATANA Walker.

BY HARRISON G. DYAR.

I had originally prepared some notes on this genus for *ENTOMOLOGICA AMERICANA*, but in response to the request of Prof. Smith I have enlarged them somewhat to include all the species. Eight species inhabit the State of New York, and I include four others not found here.

In the following I give distinctive characters only when the species has been already well described, and a brief description of the larva, when known. I have not attempted to give a full bibliography, but give a reference for the original description, and one for the larva, the latter distinguished by an asterisk.

### ***Datana augusii*** Grote and Robinson.

G. & R., Proc. Ent. Soc. Phil. vol. vi, p. 9\* pl. 2, fig. 1.  
Beutenmüller, Can. Ent. vol. xx, p. 135.\*

Readily known by its dark smoky brown color, common to the whole insect both above and below. The lines are five in number, and are arranged as in the other species of this group (§ 1 of my table). They are variable in position and furnish no distinctive characters. The discal spots are often slight, the outer sometimes linear. The description by Grote and Robinson is most excellent.

The larva is black, the lines fine and colored light yellow.  
Food-plants: Hickory, Walnut, Birch.

### ***Datana ministra*** Drury.

Drury (as Phakena), Exot. Lep. vol. 2, p. 25, pl. 14, fig. 3.  
G. & R., Proc. Ent. Soc. Phil. vol. vi, p. 11.  
Beut., Can. Ent. vol. xx, p. 16.\*

This species is of a pale yellowish brown with usual markings. The discal spots are usually absent, and sometimes also the fourth line. The hind wings are pale.

The larva has often been described, frequently the other species being confounded with it. It is black, with the cervical spot yellow, the lines sulphur-yellow, not confluent posteriorly.

Food-plants: various fruit trees, Linden, Oak, Elm, etc.

### ***Datana californica*** Riley, MS.

Prof. Riley's description has not yet appeared, but I give a brief characterization in order that I may include the species in my table:

Exterior margin of primaries excavate between the veins. Thorax and abdomen nearly concolorous with the primaries, the thorax sometimes paler. The patch on the head and anterior portion of the thorax pale brown, with an ochereous tinge on head and collar, often contracted laterally at the middle of the thorax. Primaries pale testaceous, a slightly darker shade on the costal half, quite thickly sprinkled with brown scales. Discal spots usually present in the female, but rather obscure, fainter in the male; the outer spot elongate, the inner round, composed of brown and whitish scales, slightly elevated. Five light brown transverse bands and apical streak, the first curved, in some specimens dislocated a little at the costa, the rest nearly parallel; all but the fifth obsolete at the costa and the fourth often faint, especially in the male. The apical streak starts from below the apex, and is then angulated downward, in some examples nearly parallel to the fourth line, often with the upper part obsolete. Fringe brown. Secondaries very pale testaceous, unicolorous. Wings below as secondaries above, but primaries have a slightly darker tinge towards the apex and fringes. Expanse ♂ 44—45 mm.; ♀ 45—53 mm.

The species is close to *D. ministra*, but is distinguished by its pale, nearly uniform colored primaries, and pale secondaries.

Prof. Riley informs me that he intends to describe the larval stages when his description of the species appears.

From Santa Clara County, Cal.

***Datana drezelii*** Hy. Edwards.

Hy. Edwards, Papilio, vol. iv, p. 25.\*

Beut., Can. Ent. vol. xx, p. 57.\*

As Mr. Edwards' description is wholly comparative, I give one in full:

Head and thoracic patch tawny brown, the latter darker posteriorly and sometimes constricted. This is a variable character; the rest of the thorax is concolorous with the fore wings. Abdomen pale reddish brown, the tip sometimes darker. Fore wings excavate between the nervules on the outer margin, pale yellowish brown, much the color of *D. ministra* and distinctly irrorate with dark brown scales, which are thickest below the median vein, inside the second band. The costal portion above the median vein and before apical streak is dull fulvous, contrasting with the rest of the wing and mainly lacking the irrorations. Five transverse dark brown lines as in allied species, somewhat variable in position and shape, the three central ones obsolete on the costa; a round central discal dot and the discal cross vein largely covered with dark scales. These two spots appear somewhat darker than the lines, while the second line runs beyond, through or nearly inside the outer discal spot. Fringe dark brown. Hind wings largely shaded with brown, but paler at the base; underside as in *D. major*. Expanse 45—55 mm.

The larva is black, joint 2 wholly yellow, the stripes citron-yellow and confluent posteriorly.

Food-plants: Witch-hazel and Huckleberry (*Vaccinium*).

**Datana major** Grote and Robinson.

G. & R., Proc. Ent. Soc. Phil. vol. vi, p. 12, pl. 2, fig. 3.

Dyar, Can. Ent. vol. xxi, p. 34.\*

The male has the exterior margin of primaries nearly straight, the female slightly excavate between the veins. In this character the species approaches § 2 of my table, and consequently I place it last in § 1. It is distinguished by its large size, the distinct dorsal spots and the *nearly uniform* reddish brown color of both wings. I know of but one constant character to separate the moth from *D. drexelii* (viz., the fulvous costal shade of the latter), but the larvæ differ greatly.

The mature larva of *D. major* is black, the head, cervical spot and anal plates dark red; the body has rows of subquadrate spots bright canary-yellow or clear white.

Food-plant: *Andromeda ligustrina*.

A peculiarity of the larvæ is their separating and feeding singly after the last moult. Mr. Beutenmüller has shown me examples of the moth which were small, the costa unusually yellowish with the second band bent to pass inside the outer discal spot. He stated that they were raised from the characteristically spotted larva of *major*. It seems probable that they are a dwarfed form of *D. major*, arising from insufficiency of food in the larval state. If compelled to live together, after the last moult (as these were), the larvæ will not eat well and the moths would be small. The position of the lines is not constant in this species.

**Datana palmii** Beutenmüller.

Beut., Psyche, vol. vi, p. 299 (1890).

This species was described from Pennsylvania, but it also occurs in New York. It seems to be a mountain species, the localities so far known being Delaware Water Gap, Pa., and the Catskill Mountains, N. Y. It may be known by the following characters:

Head and thoracic patch cinnamon-brown, the former paler. The rest of the thorax is of the color of the fore wings. Abdomen pale testaceous, as in allies. Fore wings entire along the outer margin, but showing a trace of the excavations, dull pale lilac, rather thickly covered with dark brown irrorations, in the female almost obscuring the ground color between the first and fifth bands. Five cinnamon-brown bands, the color of the irrorations and apical streak as in allies, the first, second and fifth distinct, the others more or less obsolescent. The discal spots are just discernible, the outer the more distinct, much as in *D. integerrima*. Fringe cinnamon-brown. Hind wings rather pale, but tinged with brown. The underside gives no distinctive characters.

*Mature Larva.*—Head rather light orange-red, the mouth paler and jaws black. Palpi black, the base and two rings white. Scattered black hairs, width of head 5 mm.; cervical spot and anal plates orange-red, with a few short black hairs. Body black, with four lateral pale yellow lines, narrower than the intervening spaces, the upper two replaced on joint 2 by the cervical spot, and all somewhat broken on joint 13, barely reaching the anal plates. Three ventral lines, one interrupted by the bases of the legs on each side, the third in the center of the venter, interrupted on joint 13. The bases of the legs are orange-red and also corresponding spots on the legless segments. Thoracic feet black, abdominal with a black band outwardly, the anal feet nearly all black; a number of rather long whitish hairs scattered over the body.

Food-plant: *Vaccinium stamineum*.

***Datana floridana*** Graef.

Graef, Bull. Brookl. Ent. Soc. vol. ii, p. 37.

Koebele Bull. Brookl. Ent. Soc. vol. iv, p. 21.\*

This is described as "dark brown, with a purplish flush" on primaries. The third and fourth lines are obsolete, leaving but three lines. This species is close to *D. palmii*, and seems to differ only in the greater abundance of the brown scales, causing the fainter lines to become lost and the purplish color to be less distinct. A specimen kindly loaned me by Prof. Lintner and labeled "from Elliot, *Datana floridana* Graef, var. ♀ N. York," cannot be this species, but is *D. palmii*. The lines are all present, the ground color is distinctly of a lilac shade, and it only differs from my specimens of *palmii* in being of a slightly duller shade and in having the secondaries more heavily tinged with brown. The larvæ appear to differ. Mr. Koebele describes that of *D. floridana* as "black, with eleven parallel yellowish lines (he does not give their width); the head, the summit of the body segment, the anal coverings, and the summits of the legs, deep mahogany red. . . ."

Mr. Beutenmüller, in his table, gives the lines as wider than the intervening spaces (in *D. palmii* they are narrower, but not much so). The larva is unknown to me.

***Datana modesta*** Beutenmüller.

Beut., Psyche, vol. v, p. 299 (1890).

This species is unknown to me. If the yellowish ochereous patch, mentioned by the describer, prove a constant feature, as it probably will, it will serve as a good distinctive character. The larva is unknown.

Kissimmee, Fla.

**Datana integerrima** Grote and Robinson.

G. & R., Proc. Ent. Soc. Phil. vol. vi, p. 12,\* pl. 2, fig. 4.  
Beut., Can. Ent. vol. xx, p. 134.\*

Dark reddish brown, the lines edged by pale shades. The lines and fringe are concolorous with the brown irrorations that thickly cover the wing, and, in a specimen from Illinois before me, blend together between the first and fifth bands, but the pale shade remains. Hind wings pale, but shaded with brown. The larva is black, the lines white, the lower the wider, but often all are absent and the insect is black. Hair long, white, more abundant than in the other species.

Food-plants: Hickory, Black Walnut, Butternut.

**Datana contracta** Walker.

Walk., Cat. Brit. Mus. pt. 5, p. 1062 (1855).  
G. & R., Proc. Ent. Soc. Phil. vol. vi, p. 14.\*  
Beut., Can. Ent. vol. xx, p. 134.\*

“Luteous tawny.” The lighter costal shade is rather more distinct than in its congeners. The lines and irrorations are nearly black, but the fringe is brown, contrasting with the bright color of the wing and distinctly of a different shade from the lines. The lines are indistinctly bordered by paler shades, caused by an absence of the irrorations which are not nearly so numerous as in *D. integerrima*. The discal spots are moderately prominent, concolorous with the lines. The larva is black, its cervical spot yellow, its lines broad, cream white.

Food-plants: species of Oak.

**Datana perspicua** Grote and Robinson.

G. & R., Proc. Ent. Soc. Phil. vol. iv, p. 489, pl. 3, fig. 1.  
Hy. Edwards, Ent. Amer. vol. iii, p. 170.\*

Readily recognized by its yellowish buff color and peculiar brown markings. The central lines (lines 2, 3 and 4) are more or less obsolete, in one specimen before me only a trace left. The outer discal spot is very large and the apical streak long; the veins from the median down, between bands 1 and 5, are marked with brown. Hind wings very pale. The larva is black or red, with broad bright yellow stripes. Head and cervical spot black or red.

Food-plant: Sumach.

**Datana robusta** Strecker.

Strk., Lep. Rhop. et Hetero. pt. 14, p. 131.

Allied to the preceding, and marked after the same pattern. The species is larger and duller colored than *D. perspicua*, and the markings are more pronounced. The absence of the usual brown thoracic patch separates it from all species of the genus so far known. Larva unknown.

The species is from Texas.

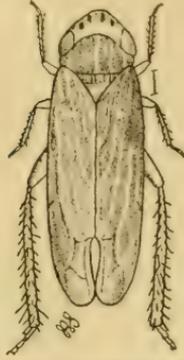


## Descriptions of two JASSIDS from the Cranberry bogs of New Jersey.

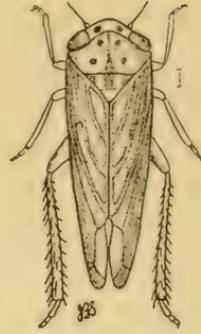
BY E. P. VAN DUZEE.



ATHYSANUS STRIATULUS  
Fallen.



THAMNOTETTIX FITCHII  
Van Duzee.



AGALLIA 4-PUNCTATA  
Prov.

**Thamnotettix fitchii** n. sp.—Form of *T. melanogaster*, but smaller. Pale yellow; abdomen and four small spots on the anterior margin of the vertex black; pronotum with five pale longitudinal lines; elytra subhyaline, with yellow nervures. Length 3—4 mm.

Head finely punctured, very little wider than the pronotum. Vertex triangular, apex obtuse, disc feebly depressed; length in the ♂ subequal to the breadth on the hind margin between the eyes, in the ♀ one-quarter shorter. Front rather broad, width between the ocelli about three-fourths the length; sides nearly straight, converging from the ocelli to the apex, but much more strongly below the antennæ. Clypeus oblong, slightly contracted at base, basal suture almost obsolete, apex truncate; loræ broad, well rounded; cheeks broad, bluntly angled at about their middle. Pronotum one-fourth longer than the vertex, hind margin feebly concave, surface very minutely, transversely wrinkled. Basal ventral segment wide, its hind margin well rounded. Valve of the male broad and short, lenticular in form and occupying the concavity of the last ventral segment; plates triangular, sides convex at base, concave above, apex a little prolonged, obtuse, ciliated. Last ventral segment of the ♀ broad, hind edge strongly advanced each side in an obtuse angle, the centre with a short blunt tooth; pygofers rather long and slender, sparingly ciliated at apex.

Color pale yellow, sometimes obscure. Vertex with a slender longitudinal line and two small spots on the disc fulvous, the latter sometimes obsolete; anterior margin with a row of four black spots, the middle pair approximate; antennal cavities and a small dot just below each ocellus, black; front embrowned, with a central longitudinal and lateral transverse pale lines more or less distinct. Eyes brown; ocelli pale. Disc of the prosternum, tip of the rostrum, claws, and a dot at the base of the tibial spines, black. Pronotum with five parallel, equidistant, pale longitudinal lines. Scutellum im-

maculate or nearly so. Elytra dusky hyaline, nervures pale yellow, distinct. Wings whitish hyaline, nervures brown. Abdomen black; connexivum, genital pieces, last ventral segment and sometimes the disc of the two or three preceding segments, yellow in the male. The female has these yellow markings on the abdomen more extended, in some examples replacing the black entirely on the venter, and the ovipositor black; otherwise like the male.

Described from ten examples, representing both sexes, taken at Buffalo, Lancaster and Colden, N. Y., and Welland County, Ontario, from July 4th to September 10th, and one example from New Jersey (J. B. Smith). In the National Museum is an example of this species labeled *Jassus ~~punctatus~~* Fitch MS., but as this name is pre-occupied for an European form I have substituted for it the one here adopted.

This species somewhat resembles *Cicadula nigrifrons* Forbes, but the head is more strongly angled before, and the elytral venation and the form of the genital pieces is different. From *T. melanogaster* it may be distinguished by its smaller size and by the position of the black spots on the vertex, which are not placed on the edge as in that species, but on the superior surface adjoining the anterior margin.

**Athysanus striatulus** Fall.?—In form similar to *Cicadula exitiosa* Uhl., but with the elytra a little wider at tip. Pale testaceous, marked with black on the head, pronotum and scutellum. Elytra pale testaceous, nervures more or less broadly margined with blackish; apical areoles smoky. Length 3—4 mm.

Head wider than the pronotum, closely and finely punctured. Vertex obtusely triangular, apex rounded, its length on the median line subequal to that of the scutellum and about one-half the width on the hind margin between the eyes; passage to the front rounded, but less so than in *exitiosa*. Front wide, abruptly narrowed to the broad apex. Clypeus broad, quadrangular, not narrowed to the tip, length one and a half times the breadth, margins rectilinear; loræ large, ovate. Cheeks broad, strongly angled below the eyes, forming a broad border beyond the loræ, but not surpassing the clypeus. Pronotum finely punctured, obscurely transversely wrinkled and slightly depressed across the disc; hind edge feebly concave.

Ultimate ventral segment of the male a little longer than the preceding, with which it agrees in form; valve broad, convex, obtusely rounded at apex; plates triangular, their margin fringed with coarse white bristles, within which are three or four short, stout spines, suture depressed. Hind margin of the penultimate ventral segment of the female feebly concave, in some examples forming an indistinct, re-entrant angle, disc with a longitudinal carina; margin of the ultimate segment quite strongly arcuated each side, leaving a rounded central lobe; pygofers rather broad, apex truncate and slightly exceeded by the ovipositor, armed with irregular stout bristles.

Male: Pale, or testaceous yellow. Vertex with an impressed line and three narrow transverse bands piceous black, the posterior angled near each

eye, the anterior triangularly advanced and much intensified on the median line, and terminating laterally at the ocelli; margins of the loræ, a broad stripe on the clypeus rarely attaining its base, an irregular spot below the eye, lower half of the temples, all the sutures and the front, black; the latter with the median line and about four short lateral arcs yellow. Pronotum pale testaceous, transversely inscribed with irregular piceous lines and spots omitting the anterior and lateral margins. Scutellum black, with about three irregular, longitudinal yellow lines of variable extent. Abdomen and all beneath deep black, margin of the dorsal segments and genital pieces, tips of the coxæ, knees, an annulus near the apex of the femora, the edges and spines of the tibiæ, and the tarsi of the anterior and intermediate feet and the posterior pair pale, the latter with the sides of the femora and tibiæ, the base of their spines and the apex of the tarsal joints, black. Elytra pale testaceous, nervures concolorous, heavily margined with fuscous, the apical areoles smoky. Wings sordid hyaline, highly iridescent, nervures brown. Female paler than the male, with the black markings much reduced, or almost obsolete. Elytra frequently with but faint indications of the fuscous areolar margins; apical areoles clear, at least on their centre. Pygofers fulvous; ovipositor black.

New Jersey. Described from five male and four female examples kindly furnished me by Prof. J. B. Smith.

This little insect corresponds very closely with J. Sahlberg's description of *A. striatulus* Fall. (Finl. and Skand. Cicadariæ p. 253), but differs considerably from that of Kirschbaum (Cicad. von Wiesb. p. 96). Only direct comparison with European material can decide its true relations. Should it prove distinct the name *vaccinii*, proposed by its discoverer to indicate its food habits, may be adopted.

NOTE.—These species and *Agallia 4-punctata* Prov. were found by me on Cranberry bogs, the *Athysanus* and *Agallia* in great numbers, the *Thamnotettix* sparsely. *Agallia 4-punctata* is common on herbage everywhere in south Jersey, the *Athysanus* I have never taken, except on the Cranberry bogs. In Bulletin K. of the N. J. Agl. Coll. Exper. Station I have treated of these species, and from thence are the figures at the head of this paper.—ED.

Occasionally even economic entomology gives a useful observation to collectors. Experimenting with whale-oil soapsuds in a wheat-field recently, I turned out a little unused mixture on the ground and was surprised to note a few minutes after, that there appeared a great lot of insects over the spot. Examination showed hundreds of Staphylinidæ of two or more species making for the place and disappearing in the loose earth. Circumstances prevented my collecting any specimens, but perhaps it may serve as a hint how these insects may be attracted.

## VARINA ORNATA Neum.

BY ANNIE TRUMBULL SLOSSON.

I took at Punta Gorda, Fla., a year ago, one male specimen of this pretty species described in "Papilio" vol. iv, p. 94. In March of the present year I captured several other males and three females. I think the female of this species has never been described. My specimens are uniformly larger than male, and much lighter in color. Their antennæ are simple, otherwise they do not appear to differ from the male type. Had I not killed these specimens in a cyanide bottle before discovering their sex, I should have tried to secure eggs, and learn the life-history of this interesting insect. I wonder if Mr. Neumoegen has revised his opinion of the proper position of *V. ornata* since he first described it. I do not pretend to be a competent judge as to generic differences and such grave matters, but I have a suspicion that after closer study of this moth its present place, "between *Parasa* and *Phobetron*," may be changed.

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## NOTES ON ELAPHIDION.

BY JOHN B. SMITH.

Some observations made by me in the Spring of 1889 on *Elaphidion* seem to add to what has been already published. In cutting about among branches for Scolytids, I found several young Oaks which had been killed by fire, how long since I could not say. Breaking one, about one and a half inches in diameter close to the ground, I found it infested by longicorn borers. I laid in a supply of sticks, representing in all cases the main stem and carried them home; splitting them open showed galleries under the bark and in the wood, a few containing pupæ, but most of them larvæ. From these issued, during the Summer, *Elaphidion villosum*, *E. paralelum* and *E. mucronatum*. I did not study the larvæ, assuming them identical, but one thing is certain: all made the same kind of burrows, and these were partly under bark, and some wholly in the wood. The burrows under bark equally contained pupæ, and all the larvæ changed to imagines in the same year. A transverse section often showed at the base of tree three and once four larval galleries, one of these evidently extending under ground. I believe the pruning habit to be by no means a universal rule, but that the beetles will oviposit wherever a suitable nidus is found, be it trunk, limb or twig.

NOTES AND NEWS.

While beating near Anglesea with Mr. Wenzel, May 28 and 29, we found the Oaks, the most abundant plant there, fairly swarming with larvæ, *Tenthredinid* and *Geometrid*. Not a leaf but had a larva, and most of them had a dozen. Many of the smaller trees were almost defoliated, and we were soon covered with caterpillars from head to foot. The umbrella and beating-net were filled with larvæ, and we were compelled to abandon the shrubbery for the open field, and even there every little seedling Oak was covered with larvæ. In the shrubbery the dropping of frass sounded like the pattering of rain, and was incessant. Skirting the wood, Mr. Wenzel noted a *Calosoma willcoxi* in pursuit of a Geometrid larva which was straining every nerve to get away. The *Calosoma* soon overhauled its victim and began eating it despite its struggles. Several of the beetles were beaten off the trees and several were taken by us running on trunks and branches. They could be easily seen and were perfectly at home in the trees; one pair was taken by me *in coitu*, the female running about on the twigs in search of prey. Only one specimen of *scrutator* was seen, while of *willcoxi* we carried off about twenty specimens and might easily have taken many more. At light, in the evening, *willcoxi* was also the common species. This was the first time I had ever seen this pretty species alive.

\* \* \* \*

In beating dead branches of Oak in Cape May County, N. J., Mr. Wenzel ran across a few specimens of *Cyrtinus pygmaeus*. Further and more careful search showed that the larvæ had riddled many of the terminal twigs, and many specimens of the imago were collected on these branches. A day or two after, May 28th, I found in the same region as many as eight specimens from a single branch, six of them in the umbrella at the same time. They bear a deceptive resemblance to ants when running around in the umbrella.

\* \* \* \*

We can testify from personal experience that the mosquito, in Cape May County at least, is not yet exterminated; there was about a million of him investigating Mr. Wenzel and myself recently, and not a solitary dragonfly in sight! Ordinarily I am provided with (and use liberally on face, neck and hands) a mixture of equal parts of olive oil and oil of tar (oil of pennyroyal will do as well), and am not bothered by them; but this time a weak reliance on the effect of the recent essays induced me to go off without this mixture, and I had to take the consequences. I recommend the above mixture as very effective and conducive to comfort where mosquitos abound.

## A NEW PAMPHILA.

BY HENRY SKINNER, M.D.

*Pamphila slossonæ* n. sp.—In size and markings this species comes nearest to *P. leonardus* Harris. The male expands rather less than an inch and a half. Ground color of inferior wings dark brown, with basal half of wing thickly covered with tawny scales which, beyond the stigma, form three spots, and just above these are two small square ones. The three subcostal spots are represented as in *leonardus*. Stigma narrow, black, and concave posteriorly. Inferior wings same color as superior, with tawny scales scattered over the basal half. There are four small, square, tawny spots close together, with a fifth elongated one at right angles with the four, on outer half of wing running nearly parallel with the outer margin, only the angle made by the spots is more acute. Fringes of all wings dingy white. The maculation on underside of superiors is nearly the same as in *leonardus*, but in color very different, the ground color in this species being made up of yellowish and greenish scales; underside of inferiors olive-green, with the spots of the upperside repeated, except there is a sixth one near the centre of the wing, and all are dingy white. Fringes on underside same as above. Head and thorax above covered with greenish hair, beneath grayish yellow. Palpi almost white.

The female expands a little more than an inch and a half. Superior wings very dark brown, with a broken band of yellow consisting of five spots commencing at the first nerve above the interior margin and extending to within one-eighth inch of apex. The subcostal spots are present, as in the male, with two additional ones at end of cell. The inferiors as in the male, but with spots fainter; underside of wings also same as in male, but the white spots on inferiors are smaller. Fringes in female dark on superiors, but gradually getting lighter on inferiors as the anal angle is approached.

Described from one pair from Florida, presented by Mrs. Slosson. I think that Hesperids can be best described by comparison with well-known species. While this resembles *leonardus* in maculation, it is very different from it, and can readily be separated by the white fringes, lighter color of markings, green underside of inferiors, greenish head and thorax and nearly white palpi, etc. I have named this species in honor of Mrs. A. T. Slosson, who has done so much excellent and interesting field work in Florida and the White Mountains of New Hampshire.

The edition of the Check-List of Macrolepidoptera published by the Brooklyn Entomological Society is exhausted. A second edition had been contemplated, but in view of the fact that almost every family is undergoing "revision," it seems unwise to publish at present. Some half a dozen copies are in the hands of the editor for sale on private account, but that will exhaust the stock, and intending purchasers had better apply at once.

## A NEW SPECIES OF PLAGIOMIMICUS.

BY JOHN B. SMITH.

**Plagiomimicus triplagiatus** sp. nov.—General color an olivaceous grayish fuscous; head paler; collar with a white line at tip; thoracic vestiture mixed with white scales. Primaries, t. a. line white, narrow, upright, but slightly curved outwardly. T. p. line white, distinct, broadly angulated beyond cell and almost reaching the s. t. line, thence sinuate and very obliquely inward, reaching the margin about three-fifths from base. S. t. line white, scarcely definite, though distinct, very even, or but little sinuate. The orbicular is entirely occupied by a deep, blackish brown spot, which sends back an obtuse spur to the reniform, which is very narrowly pale ringed and of a slightly darker shade of ground color; between the t. a. line and this brown spot a whitish shade still further relieves the dark marking. Between the outward angulation of the t. a. line and s. t. line is a triangular blackish brown costal blotch, completely filling that part of the s. t. space. Below the middle of its course the s. t. line is preceded by a blackish brown shading, gradually broadening until, at the margin it fills nearly the entire s. t. space. Secondaries whitish fuscous, paler basally. Beneath powdery, primaries with maculation of upper surface vaguely reproduced. Exp. .90 inches; 23 mm.

*Hab.*—Las Vegas; N. Mex.; Hot Springs, 7000 feet; August.

Several specimens collected by Mr. Meeske, are in the collections of Hulst and Neumoegen. The species is well marked and easily recognizable by the three blackish markings and the white transverse lines of the primaries. The species is related to *expallidus* rather than *pitychromus*.

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Dr. Hamilton describes the issuance of *Elaphidion* from the pupa skin. It is an interesting fact that some species (*Phymatodes omanus* among them) do not shed the pupa skin at all, but this gradually hardens and the beetle will walk about when still almost white and the members still cased. I watched this carefully in *Phymatodes*.

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## SOCIETY NEWS.

BROOKLYN ENTOMOLOGICAL SOCIETY, June 3d.—Meeting at Brooklyn Institute. Mr. Ottomar Dietz, chairman *pro tem.*, presiding. Twenty persons present.—Report of Treasurer presented and approved. Mr. Weeks, of Curators, presented their report of the Entomological exhibition held at the Institute under the auspices of the Department on May 22d and 23d. Exhibits were made from collections of Dr. Calvealy and Prof. B. Yaeger, and of the collection of Lepidoptera of J. E. Meyer, also by H. Meeske and

F. H. Chittenden, Coleoptera, etc., and by Col. Nicholas Pike of several hundred vials of Arachnida, together with fifty colored plates (original drawings from nature by Mrs. Pike) illustrating the life histories of the same. Total number of specimens exhibited 30,000. Number of visitors in attendance about 1300. Mr. Pearsall, chairman of the committee to confer with the Brooklyn Institute as to a modification of the agreement between the Institute and the Society, presented a report, which, on motion, was received and the committee continued, and authorized to prepare a draft revision of the By-Laws of the Society to be presented for approval at the September meeting. On motion the appropriation of \$150 made by the Council of the Institute for the support of ENT. AMER. was accepted with thanks, and the legend "Entomological Department of the Brooklyn Institute" directed to be placed on the cover of the publication after the name of the Society. Prof. Smith, of committee on joint field meeting of Philadelphia, Newark and Brooklyn Entomological Societies, reported that the committee had selected Jamesburg as the place and July 4th as the date of such meeting, and requested that all intending to join the excursion should notify the committee at least one week in advance, that proper provision might be made for lunch, etc.

Mr. Weeks opened scientific discussion by reading a paper upon the rapacity of a female specimen of *Pterostichus lucublandus* which was observed feeding upon the dead bodies of *Doryphora 10-lineata* at noon, and which, instead of seeking to escape, attempted to carry off one of the beetles, and resisted efforts made to remove its prey, making many struggles to retain possession of it.

Mr. Weeks further read a paper entitled, "Life history and enemies of local species of Papilionidæ." The local species in the vicinity of Brooklyn comprise *Papilio turnus*, var. *glaucus*, *asterias*, var. *calverleyi*, *troilus*, *cresphontes*, *philenor* and *ajax*. The paper described the season and method of ovipositing, the appearance of the egg, the food-plant, the larvæ, and the number of broods of each species, except *ajax*, in full in this locality. The principal parasite of this family was *Trogus exesorius* Brullé, which should receive the title of "*Papilio Ichneumon*," the common appellation "*Asterias ichneumon*" being misleading, because of too limited application. Other species of *ichneumon* attacked *asterias*, making the latter title still more inapplicable. Adjournment.

A. C. WEEKS,

*Recording Secretary.*

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No. 8.

## PREPARATORY STAGES OF DILOPHONOTA EDWARDSII Butl. and D. ELLO Linn.

BY HARRISON G. DYAR.

Mr. Henry Edwards has described some of the stages of the first of these species,\* and he is the only author who has described any stage but the mature larva of the second, and, as his descriptions were made from prepared specimens and differ from mine, I have concluded to publish the following. Mr. Edwards implies six larval stages for both species, which I do not find to be the case, and he has confounded the pupæ, describing that of *ello* and *edwardsii*, and that of *edwardsii* for *ello*.

The eggs are laid singly on the underside of the leaves of the food-plant. In shape they are elliptical, slightly flattened above and below, very minutely punctured. Color light yellowish green. Greatest diameter about 1.8 mm.

FIRST LARVAL STAGE.—Head whitish, eyes black. Body pale whitish, transversely creased, the caudal horn whitish at base, the rest black. Length 4 mm. It is held nearly erect. Feet concolorous with body. Length of larva 7 mm. As the stage advances the insect becomes pale green. Duration of this stage about four days.

SECOND LARVAL STAGE:—Head pale green, not shiny; eyes black; mouth very slightly brownish. Body long and slender, annulated. Caudal horn greenish white, minutely spinose, 5 mm. long. Length of larva about 15 mm. Duration of this stage four days.

\* Ent. Amer. vol. iii, p. 165.

**THIRD LARVAL STAGE.**—Head as before, mouth and palpi yellowish, eyes black. Body yellowish green, darker below, annulated and covered with little paler dots. A faint subdorsal line is visible. The horn is minutely spinose as before, pale whitish green, 8 mm. long. Length of larva 20 mm.

**FOURTH LARVAL STAGE.**—Head yellowish green, palpi and mouth paler; eyes black. A pale band before the eyes containing the sub-dorsal line of the body. Width of head about 3.5 mm. Body yellowish green, with many small, round, paler spots. Sub-dorsal line pale, edged above with blackish anteriorly. Horn spinose, pale greenish yellow, 10 mm. long. Spiracles whitish, with a brown spot across the middle. Concealed in the fold on the anterior part of joint 4 is a black, circular, bisected spot, surrounded by a white shade to the subdorsal line, which, as the stage progresses, becomes a round black spot with a white cross in it, surrounded by creamy white and a reddish shade anteriorly. Length of larva 40 mm.

**FIFTH LARVAL STAGE.**—Mature larva. Head slightly withdrawn below the skin of joint 2, whitish green, obsoletely shagreened. A vertical, pale white band just before the eyes. Eyelets four, in a semicircle, partly brown. Mouth and palpi whitish. Width of head about 5 mm. The body is folded dorsally on the anterior parts of joints 3 and 5. Each joint, except 2, 12 and 13, has eight annulets. Caudal horn thick and curved, 5 mm. long, concolorous with the body, but having a slight purple shade at the base. Body light green, thickly covered over the dorsum with short longitudinal diffuse brown streaks, about one on each annulet. These streaks are less numerous on joints 2, 3 and 4, and show a tendency to segregate on these segments into dorsal and sub-dorsal lines. On joints 12 and 13 they are nearly absent. The small round spots of the preceding stage are much reduced in size or obsolete. In the fold of joint 3 is a pale white, or purplish shade, and on joint 4 concealed in the fold when the insect is at rest is a round black patch containing a bluish white linear cross, surrounded by a reddish ring and a purplish shade to the sub-dorsal lines. In some specimens there is a faint purplish sub-dorsal line extending to the caudal horn. Spiracles white, nearly covered by a central pale brown spot. Thoracic feet whitish, abdominal concolorous with the body, the three anterior pair less well developed than the rest. Venter mottled with whitish. Length of larva about 75 mm.

When not eating, the larva rests on the back of a leaf of its food-plant on one of the large ribs, which it much resembles in color. Its length and slimness also serve to conceal it, as it might be mis-

taken for part of the leaf rib. During the last stages, if disturbed, it raises the front part of the body, drawing down the head and exposing the vivid mark usually concealed in the fold of joint 4. At the same time it knocks its head and the anterior portion of its body violently from side to side. This demonstration, with the sudden appearance of the highly colored spot, is doubtless intended to terrify its enemies.

The duration of the first three stages is about four days each, but the last two continue twice as long or more. Pupation occurs in a slight cocoon composed of leaves or other loose material, at the surface of the ground.

**PUPA.**—Long and slender; very lively in its motions if disturbed, often giving itself a peculiar rapid rotary motion, the point of the cremaster and head of the pupa only touching the ground. Color very shiny red-brown, curiously marked with black, as follows: on the head above between the eyes, legs and antennæ cases each with a streak centrally, wing cases in all the interspaces between the veins somewhat interrupted basally, thorax marked obscurely with several streaks following around its edge, each abdominal segment has a transverse band posteriorly and many little transverse streaks, beside marks between the segments, all becoming more extended posteriorly, so that the last segment is nearly all black, only a brown line being left. Spiracles black; cremaster flat and broad, with two excavations below, narrowing more abruptly for its last half and ending in a thick blunt spine, all densely punctured. Body sparsely punctured, more thickly between the segments. The wing cases show obsolete creases. Length of pupa about 60 mm.; greatest diameter 12 mm. Duration of this stage about twenty days.

Food-plant, *Carica papaya*. Larvæ from Dade County, Fla., near Lake Worth.

### ***Dilophonota ello* Linné.**

**EGG.**—Nearly spherical, smooth, and of a dark green color. Diameter about 1.5 mm. Laid singly on either surface of the leaf.

**FIRST LARVAL STAGE.**—Head pale yellow, the mouth paler, but the eyes and ends of jaws black. Width probably 6 mm. Body pale green, with a dark dorsal shade. Later it is seen to be annulated and dotted with small, pale whitish spots. An obscure white subdorsal band. The caudal horn is black, 2.5 mm. long. Length of larva 6 mm.

**SECOND LARVAL STAGE.**—Head pale greenish yellow, not shiny. Mouth and palpi paler; an obscure vertical pale line. Eyes

black. Width probably 1 mm. Body yellowish green, the leaves it has eaten showing as a darker shade; marked as before, but more distinctly. Caudal horn very pale yellow, blackish at the tip, reddish at the base and 3.5 mm. long. Larva 12 mm. Later the horn is reddish with small black spines; a very faint purplish shade on joint 4 concealed by the fold. Feet reddish.

THIRD LARVAL STAGE.—Head yellowish green, the jaws and bases of the palpi paler. The lower joint of the palpus is red, the eyes black. A faint paler band continues the subdorsal line of the body. Width of head 1.8 mm. Body whitish green, with many round, small, whitish spots separated in the subdorsal space by interrupted, wavy, black lines. A whitish subdorsal line, edged above with black, converges at both ends, ending at the horn and being faint on joint 2. On the anterior part of joint 4 is a black spot with a white line in the center, surrounded by a whitish diffuse circle and supplemented by two dark red spots one at each side. Horn yellow, reddish at the base with small black spines. Spiracles yellow, with a red spot centrally. Thoracic feet reddish orange; abdominal tinged with the same color. Length of horn 4.5 mm.; of larva 20 mm.

FOURTH LARVAL STAGE.—Head flattened in front and at the sides, partly withdrawn under the skin of joint 2. Color pale green, minutely roughened. A broad, pale whitish band before the eyes, continues the subdorsal line of the body. Eyes black, mouth pale, the tips of the jaws black; palpi reddish. A few minute hairs over the surface. Width 3 mm. Body whitish green, with many yellowish round spots separated by longitudinal, wavy, interrupted black lines, which are fainter on the sides and absent on the venter. A pale yellow subdorsal band, narrowly edged above with black, except on joint 2, ends at the horn. There is a trace of a dorsal line on joint 3. Caudal horn pale yellow, reddish at the base, minutely spinose, the spines brown. Length 6 mm. Cervical shield and anal plates pale green, with small, white, elevated spots. In the fold on the anterior part of joint 3 is a white and a purplish shade, and the mark partly concealed in the fold on anterior part of joint 4 consists of a round black spot with a central line surrounded by a broad yellowish white ring and beyond this a reddish pink shade to the subdorsal line, which is here, and at the mark on joint 3, nearly white and crossed faintly by the purplish shade. Spiracles white, crossed by a central black band. Thoracic feet pinkish, thrice annulate with black. The abdominal feet, of which the three anterior pair are less well developed than the rest, are pale reddish

with a black band and claspers whitish. Later they become nearly as in the last stage (except the pair on joint 13, which are plain), but the lower white band and the olive gray band are replaced by reddish, divided by a brown line. Length of larva about 40 mm.

FIFTH LARVAL STAGE.—The mature larva varies from dark green of the color of the leaf of its food-plant to brown. The green form has the markings of the brown form more or less obsolescent. The subdorsal line is usually distinct, the marks in the folds pale, affecting the sub-dorsal line much as in the previous stage. The brown form is as follows: Head flattened at the sides, white, the sutures marked with black and the following black marks; a short line in the center of the triangular plate basally; two shades on either side of the central suture, converging slightly vertically; a line up from the base of the palpus, dilated centrally and blended inwardly; a short line covering the eyes and a line on the posterior portion of the side of the head. Palpi tipped with reddish. Head minutely and sparsely pilose; width, 5 mm. The caudal horn is a conical rounded tubercle, from an elevated base, white. Body purplish gray, with many round, small, diffuse yellowish spots, and longitudinal, short, wavy black lines between them, more pronounced above the sub-dorsal line and forming its border. This converges on joint 3 and forms a continuation of the lines of the head. This line also converges on joint 12 and ends at the horn. A series of black shaded dorsal spots on joints 5-11 anteriorly. Laterally, and especially in patches between the segments superstigmatally, the yellowish spots are paler and enlarged, some partly confluent, giving the body a paler appearance, while the black lines are fewer and more diffuse. The dorsum of joint 2 imitates the markings of the head, having a dorsal line and the sub-dorsal space filled in with a dull olive shading. Below this it has a broad white band; joint 3 is suffused over the dorsum with a nearly uniform purplish flush, but the markings reappear on the posterior part, widened and more diffuse and end on the fold on the anterior part of joint 4, which has nearly concealed a round black spot, bisected by a narrow blue line surrounded by a white ring, and this nearly enclosed by an olive-brown shade, replaced by pinkish to the sub-dorsal line. Venter pale, the black marks nearly lost. Thoracic feet white, with three black rings; the abdominal (of which the last two pair are best developed) on joints 7-10 are as follows: Base white, next a broad velvety black stripe, then a powdery blue stripe, a yellowish one edged by a narrow blackish line and followed by a white band, a black line, a broad olive-gray band and the claspers white. Anal

feet unornamented, the plates yellowish gray, with rather few elevated white spots. Spiracles white, bisected by a gray band. Length of larva 80–100 mm.

COCOON.—Formed of threads and loose material at the surface of the ground.

PUPA.—Of similar shape to that of *Dilophonota edwardsii*, but much more robust and less lively. It is marked after the same pattern in black and red-brown, but the black is very extensive, covering nearly the whole pupa. Color black, very shiny, marked obscurely with red-brown on the veins of the wing cases and on the leg cases; a curved line at the back part of the thorax, and a more distinct, wavy, narrow band around each of the anterior abdominal segments. Body punctured between the segments; wing cases and thorax creased. Cremaster flat, somewhat rounding above and below, broad at the base and tapering evenly to the front; densely punctured. Length of pupa 55 mm.; width, 13 mm. Duration of the larval stages from three to seven days; of the pupa twenty-eight days.

Food-plant, *Euphorbia cyathophora*. Larvæ from Dade Co., Florida.

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## CONTRIBUTIONS TOWARD A MONOGRAPH OF THE NOCTUIDÆ OF TEMPERATE NORTH AMERICA.

### Revision of *Scopelosoma* Curtis.

BY JOHN B. SMITH.

Genus **SCOPELOSOMA** Curtis.

1838 Curtis, *British Insects* xiv, 635.

Eyes naked, strongly lashed; the lengthy strong hair almost meeting over the eye. Head strongly retracted, the front clothed with short, loose, somewhat divergent vestiture; palpi very short, scarcely reaching the front. The antennæ are simple, or with a single lateral bristle in the ♀; simple, with lateral tufts of fine short hair in the ♂. Thorax quadrate, somewhat depressed; vestiture hairy, in some species with elongate scales intermixed; rather long and decumbent, smooth. The collar is slightly prominent in front, and there is an elevated anterior crest, very distinct in good specimens. The abdomen is depressed, in the ♂ more or less flattened, little or not exceeding anal angle of secondaries. The legs are unarmed, and the underside is rather thickly clothed with woolly hair.

The primaries are short, subequal, with rectangular apices, outer margin straight to middle, then obliquely inward, angle not retracted.

The genitalia of the ♂, so far as known, are referable to three types, or rather there are two types, and two of the species which are otherwise very close to others are aberrant in this respect.

The species are readily divisible into two series—the first with broader primaries, bright colors—yellow forming a prominent feature, distinct, oblique or slightly sinuate median shade line, and well defined ordinary spots; the second with distinctly narrower primaries, dull colors of which luteous usually forms a base, median shade line usually distinct, but angulated above middle. Ordinary spots not defined, orbicular in all except *3-stigmata* obsolete. The first series contains *græfiana*, *moffatiana*, *pettiti* and *ceromatica*. Except *moffatiana*, these species have practically similar genitalia. The harpes are broad, the upper margin thicker; chitinous, curved and produced into a blunt, rounded tip, from the lower edge of which projects a small acute spur. The clasper is a rather long, stout, corneous hook, extending nearly to the end of the projecting harpe, and but moderately curved. The slight differences in detail between the species are better noted by a comparison of figures than by any description.

I head the species with *græfiana*, which is pale ocher-yellow, with rigid, single, median lines and an almost equally rigid median shade line.

*Moffatiana* is closely allied in color and maculation; so closely indeed, that for a long time they were considered identical. The superficial differences narrow to a deeper, more reddish ground color, and less rigid transverse lines. The t. a. line especially, is in this species usually bent on the subcostal vein. The ♂ genitalia are of an entirely different type from the other species of the group. The harpes are narrow, elongate, the upper margin straight, the inferior margin obliquely curved, meeting the upper margin in an acute point at tip. From the middle of upper margin extends a corneous rib, obliquely downward and projecting as a spur considerably beyond the margin of harpe. The clasper arises rather near the base of the harpe, is stout, strong, obtuse and somewhat enlarged at tip and forms an irregular half circle. This strong difference in species otherwise so nearly allied is remarkable.

*Pettiti* is a small species, the smallest of the genus in fact, the ground color like *moffatiana*, but all the maculation indistinct. From both the preceding it differs by the crenulate t. p. line.

*Ceromatica* agrees with *pettiti* in the crenulate t. p. line, but it

is much larger, and the color is an intense orange-red, with violet powderings.

The second series contains the remainder of the species, and these again with the exception of *vinulenta* agree in genital structure. The harpes are rather elongate, of moderate width, equal to near tip, then suddenly narrowed and bent, the tip again somewhat broader, obliquely truncate or rounded, inwardly fringed with very fine spinules. The clasper extends along upper margin of harpes to the bend, is there very abruptly curved and extends straight downward, considerably beyond the tip of harpes.

*Tristigmata*, *walkerii* and *sidus* have the t. p. line dark and crenulate; *morrisoni* and *devia* have it pale and even.

*Tristigmata* has the orbicular distinct, and the claviform evident, differing by the first of these characters from the others in this series by the second from all the others of the genus. The color is a reddish luteous.

*Walkerii* lacks the orbicular, has the reniform usually marked with white, and is reddish luteous, powdery.

*Sidus*, of which *vinulenta* is undoubtedly a synonym, differs superficially only in the dull, somewhat rusty red-brown color. The maculation is identical, but usually more strongly marked. The genitalia are very different, and somewhat like *moffatiana*; the harpes are moderately wide, lower margin excavate near tip, which narrows to an obtuse point. The clasper is like that of *moffatiana*.

*Morrisoni* is again luteous reddish, like *walkerii*, but differs as already indicated by the even, pale t. p. line.

*Devia* is more mouse-gray in color, with white powderings. The distinctive feature of the species is a broad, oblique shade through s. t. space, and the approximate median lines.

In synoptic form the species are distinguishable as follows:

Wider winged species; ocher yellow to dark brick red, the median shade prominent; ordinary spots large, defined.

T. p. line very distinct, even, not crenulate or marked on veins.

Paler ocher yellow; t. a. line upright . . . . . *græfiana* ✓

Darker yellow; t. a. line obtusely angulate on subcostal vein. *moffatiana* ✓

T. p. line less contrasting, crenulate, marked on veins by darker points.

Reddish ocher yellow; size smaller . . . . . *pettiti* ✓

Dark orange-red, with violet powderings; larger . . . . . *ceromatica* ✓

Narrower winged species; luteous to red-brown; median shade less distinct; ordinary spots smaller, indefinite or obsolete.

T. p. line crenulate; dark.

Orbicular distinctly, claviform faintly indicated . . . . . *tristigmata* ✓

Orbicular and claviform wanting.

Luteous to fuscous or reddish powdery . . . . . **walkerii.**  
Red-brown . . . . . **sidus.**

T. p. line even, pale.

Variable in color; luteous to brown; t. p. line irregularly sinuate; s. t. line irregular, angulate . . . . . **morrisoni.**

Sordid luteous gray; t. p. line evenly bisinuate; a distinct, rigidly oblique pale shade line through s. t. space . . . . . **devia.**

**S. græfiana.**

1874, Grt. Buff. Bull. ii, 69, *Scopelosoma*.

1882, Grt. ‡ Ill. Essay 65, pl. 3, fig. 438, *Scopelosoma*.

Rather pale yellow, with orange irroration; transverse lines distinct, brown. Basal line distinct. T. a. line rigidly upright, or slightly oblique.



T. p. line inwardly oblique; with a small outward curve on costa, thence rigid to hind margin. A distinct, slightly arcuate median shade line equally distinct from costa to inner margin; forming inner boundary of reniform. S. t. line very faint, barely traceable, irregular, punctiform. A row of terminal lunules.

Ordinary spots concolorous, ringed with brown. Orbicular small, round; reniform large, slightly constricted medially. Secondaries pale yellow, with an outer darker line. Beneath pale yellow, with a more or less complete outer line; secondaries with discal lunule. Head and thorax concolorous with primaries. Antennæ of ♂ with fine lateral tuftings, of ♀ perfectly simple. Expands 1.30—1.50 inch.; 33—38 mm.

*Hab.*—New York northward.

The differences between this species and the closely allied *moffatiana* are elsewhere discussed.

**S. moffatiana** Grt.

1882, Grt., Bull. U. S. Geol. Surv. vi, 583, *Scopelosoma*.

*græfiana* ‡ Grt.

1882, Grt., Ill. Essay 65, pl. 3, fig. 38, *Scopelosoma*.

1882, Grt., Bull. U. S. Geol. Surv. vi, 583, pr, syn.

Rather deep reddish yellow, the lines distinct, darker brown. T. a. line somewhat arcuate, rarely nearly rigid. T. p. line with an initial curve on costa, thence inwardly oblique and usually somewhat arcuate to hind margin. S. t. line faint, irregular. A row of terminal lunules; median shade line rather broad, diffuse, subsinuate. Ordinary spots concolorous with brown outlines; orbicular



rather small, round; reniform large, somewhat constricted at middle. Secondaries pale yellow, with a reddish suffusion, the outer line of underside sometimes faintly reproduced. Beneath as in *græfiana*. Head and thorax concolorous with primaries. Expands 1.40—1.50 inch.; 35—37 mm.

*Hab.*—New York, northward.

**S. pettiti** Grt.

1875, Grt., Can. Ent. vii, 188, *Scopelosoma*.

1877, Grt., Can. Ent. ix, 213, *Scopelosoma*.

Deep reddish yellow, all the maculation indistinct. Basal line often obsolete. T. a. line upright, often obsolete. T. p. line oblique, arcuate, marked on veins with black points, which makes it seem crenulated. S. t. line indistinct, also marked with faint blackish shades on the veins. A row of indistinct terminal lunules; median shade rather diffuse, always distinct; slightly or not at all sinuate. Ordinary spots concolorous, faintly outlined; orbicular small, round, often scarcely discernible; reniform large, more obvious, with a blackish spot inferiorly. Secondaries pale yellow, with a faint reddish suffusion. Beneath as in *graciana* and *moffatiana*. Expands 1.10 inch.; 27 mm.



*Hab.*—Canada, Iowa, New York.

This species is readily distinguished from all the broad winged forms by the obsolete maculation and small size. From *ceromatica*, its nearest ally, it is distinguished by the much more yellowish-red color.

**S. ceromatica** Grt.

1874, Grt., Buff. Bull. ii, 70, *Scopelosoma*.

1874, Grt., Buff. Bull. ii, 125, *Xanthia*.

Rather dark orange-red, with violet powderings; terminal spots somewhat darker; median lines brown. T. a. line upright, or but feebly arcuate, even. T. p. line parallel with, and rather close to outer margin, crenulate; the points blackish. S. t. line irregular, inwardly diffuse, slightly paler; outwardly limited by the darker terminal space. Basal line barely traceable. A distinct, slightly sinuate median shade line, touching outer boundary of reniform. Orbicular small, round, concolorous, with darker outline and a pale inner annulus. Reniform large, kidney shaped, darker, with pale ring; inferiorly there is a blackish dot. Secondaries luteous, with an orange suffusion. Head and thorax concolorous with primaries. Beneath pale yellowish orange, with a red-brown outer line; secondaries with discal lunule. Antennæ of ♂ thicker and ciliate; of ♀ more slender and simple. Expands 1.20—1.40 inch.; 30—35 mm.



*Hab.*—New Jersey, New York, Maine, New Hampshire, Canada.

A very distinct form, recognizable by the deep orange color and violet powderings; it is the most intensely colored of the wide winged species.

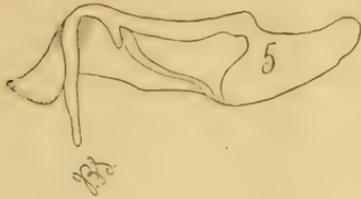
**S. tristigmata** Grt.

1877, Grt., Can. Ent. ix, 156, *Scopelosoma*.

1884, Thaxter, Can. Ent. xvi, 33 (life history).

Reddish luteous, with black powdering, transverse lines and ordinary

spots distinct; terminal space darker, more heavily powdered. Basal line distinct, black. T. a. line upright, somewhat irregular, varying in shade from brown to black. T. p. line black, parallel with outer margin, with black



points on veins making it crenate. A more or less broken brown shade in s. t. space serves to indicate the concolorous s. t. line. Through the median space is a dark brown shade, outwardly angulate, the angle touching the black filling of inferior portion of reniform; the latter is large, not defined, usually of a paler shade of ground color, but

often white; always, however, the inferior portion is black filled. The orbicular is small, round, concolorous, neatly brown ringed. The claviform is small, pointed, inconspicuous, but evident in all specimens I have seen. Head and thorax concolorous with primaries. Secondaries blackish with reddish fringes. Beneath reddish powdery, with a variably distinct outer line and discal lunule. Expands 1.20—1.40 inch.; 30—35 mm.

*Hab.*—Dist. Columbia, New York, Massachusetts, New Hampshire, Maine, Canada.

A very distinct species, evidently belonging to the narrow winged series, and yet with considerable likeness in maculation and habitus to the wider winged forms. The black spot in inferior portion of reniform, the evident claviform, the darker terminal space and crenulated t. p. line are distinctive.

**S. walkerii** Grt.

1864, Grt., Proc. Ent. Soc. Phil. ii, 439, pl. 9, fig. 5, *Dichagramma*.

1873, Grt., Buff. Bull. i, 192, *Scopelosoma*.

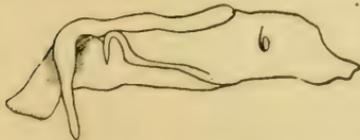
1874, Grt., Buff. Bull. ii, 71, ? an var. *sidus*.

1875, Grt., List Noctuidæ, an sp. dist.

1882, Grt., New List, an var. *sidus*.

1884, Thaxter, Can. Ent. xvi, 31, an sp. dist. *vinulenta* (life history).

Reddish luteous, powdery, maculation often indistinct, subobsolete. Basal line rarely traceable. T. a. line often indistinct, or even entirely wanting; when present, rigidly upright, pale or dusky, preceded by a narrow pale shade. T. p. line well removed toward,



and parallel with the outer margin; crenulate, dusky or blackish; often indistinct. S. t. line very faint, concolorous, barely traceable, sometimes more relieved by blackish powderings at either side; median

shade variably distinct, angulate; the angle touching the reniform inferiorly. Orbicular wanting; reniform a narrow, blackish lunule, usually with a larger ovate white spot in the middle and small white dots at the tips. Secondaries smoky to blackish, with pale fringes, variably shaded with reddish. Beneath with a dusky common line, variably complete; and a discal lunule. Antennæ

laterally bristled in both sexes, much more distinctly, however, in the ♂. Head and thorax concolorous with primaries. Expands 1.25—1.45 inch.; 31—36 mm.

*Hab.*—Texas, Iowa, New York, Canada, Maine.

In this species the tendency is to an obsolescence of all markings, and not infrequently the large white spot in the reniform will be the only distinct feature of the wing. Mr. Thaxter, in describing the larva of this species, concluded it distinct from *sidus* (*vinulenta*), a conclusion which is strikingly borne out by the structural characters.

**S. sidus** Gn.

1852, Gn., Sp. Gen. Noct. i, 386, *Scopelosoma*.

1856, Wlk., C. B. M. Mus. x, 454, *Eupsilia*.

1873, Grt., Buff. Bull. i, 191, *Scopelosoma*.

1874, Grt., Buff. Bull. ii, 71, *Scopelosoma*.

*vinulenta* Grt.

1864, Grt., Proc. Ent. Soc. Phil. ii, 440, pl. 9, fig. 6, *Dichagramma*.

1873, Grt., Buff. Bull. i, 191, pr. syn.

1874, Grt., Buff. Bull. ii, 70, an sp. dist.

1882, Grt., New List, an var. *sidus*.

1884, Thaxter, Can. Ent. xvi, 32 (life history).

Vinous red-brown, more or less powdery, terminal space darker, all the lines distinct. Basal line distinct, obsoletely geminate, included space paler, of a violet tint. T. a. line rigidly oblique, darker brown, with a preceding violet shade. T. p. line blackish brown, parallel with outer margin, somewhat dentate or crenate on veins. S. t. line broad, concolorous, or but slightly paler, marked by the dusky terminal space, and a preceding darker brown shade. The median shade is blackish, diffuse, angulate as in *walkerii*. Reniform also as in *walkerii*, orbicular wanting. Secondaries blackish, with paler reddish fringes. Head and thorax concolorous. Beneath rusty, powdery, disc of primaries blackish; a common outer dark line and dark discal lunule. Antennæ ciliate, most evidently so in the ♂. Expands 1.20—1.40 inch.; 30—35 mm.



*Hab.*—Texas, New York to Canada.

The only one of the narrow winged species that is vinous brown in color, and therefore readily distinguished. The affinities of the species are elsewhere discussed. It is variable in color, and the white of reniform is a variable quantity. Sometimes this species and *walkerii* will be so nearly alike in color that it will require close examination to properly refer a specimen. Both in genital structure, however, and in larval history they are distinct.

**S. morrisoni** Grt., Buff. Bull. 2, 70.

1874, Grt., Buff. Bull. ii, 70, *Scopelosoma*.

1884, Thaxter, Can. Ent. xvi, 30, life history.

Luteous to ferruginous, finely powdered; median lines narrow, pale, even. Basal line pale, often indefinite or wanting. T. a. line rigidly upright, or slightly oblique, rarely faintly sinuate. T. p. line variable; rarely rigidly upright, often arcuate or sinuate, usually about parallel with outer margin. S. t. line faint, hardly paler, irregularly dentate; sometimes preceded by a slightly darker shade. Orbicular obsolete; reniform sometimes obsolete, more usually marked as a narrow, slightly paler, rarely



white lunule, inferiorly with a blackish dot. The median shade line is indistinct, or entirely wanting. Secondaries blackish, with pale, more or less reddish fringes. Head and thorax concolorous with primaries. Antennæ ♂ ♀ with lateral bristles to each joint. Expands 1.40—1.48 inch.; 35—37 mm.

*Hab.*—New York, Massachusetts, northward to Canada.

Distinguishable by the even, narrow, pale median lines and indistinct irregularly angulate s. t. line.

**S. devia** Grt.

1874, Grt., Proc. Ac. Nat. Sci., Phil. 1874, 209, *Scopelosoma*.

1884, Thaxter, Can. Ent. xvi, 33, life history.

Mouse-gray, with pale powderings, less distinct in median space; median lines whitish. T. a. line remote from base, inwardly oblique, even, rigid. T. p. line rather narrower, even, bisinuate. S. t. line distinct, pale, irregularly sinuate; through the middle of the s. t. space is a rigidly oblique, rather broad, pale shade line. Orbicular wanting, reniform narrowly and incompletely outlined. The basal line is usually traceable, but often absorbed in the pale powderings of the basal space. The median lines are unusually approximate. Secondaries a shade paler than primaries, but not powdery. Beneath like secondaries above; powdery; a broad, diffuse, outer line on both wings. Head and thorax concolorous with primaries; abdomen with secondaries. The ♀ antennæ are laterally bristled, in front clothed with pure white scales for half their length. Exp. 1.20—1.32 inch.; 30—33 mm.



*Hab.*—New York and northward.

This species is very readily distinguished by the absence of median shade line, and the presence of a broad pale shade through s. t. space. It is rather rare.

The first meeting of the Entomological Club of the A. A. A. S. will be held at the room of the Biological Section, at the State House, Indianapolis, Ind., at 9 A. M., Wednesday, August 20th. Members expecting to attend will please notify the President, Prof. A. J. Cook, Agricultural College, Michigan, or the Secretary; and all expecting to present papers are urgently requested to forward titles to F. M. Webster, Sec'y, Lafayette, Ind.

## Remarks on the Habits of some species of Cleridæ.

BY FRANK H. CHITTENDEN.

*Elasmocerus terminatus* Say.—Last year at Staten Island, May 17th, I discovered in an infested grape vine a larva of *Phymatodes amœnus*, to which was attached another larva engaged in devouring it by absorbing its juices. The predaceous larva had begun operations at the caudal extremity of the Cerambycid, about one-quarter of which was shriveled up. The remainder was intact, and the insect was still alive when placed in alcohol two days later. A pupa found at the same time was almost entirely white, greatly resembling a hymenopterous pupa. On the 18th it had begun to color, the elytra assuming a darker hue, and on the following day the species was recognizable.

*Trichodes apivorus* Germ.—I have found on the flowers of *Solidago* and the New Jersey tea plant (*Ceanothus americanus*) during July and August. Ithaca, N. Y.

*Clerus rosmarus* Say.—A specimen was observed last year seated on the leaf of a shrub devouring a small Nitidulid, *Cercus abdominalis*. Orange, N. J., June 9th.

*Thanasimus dubius* Fab. is probably restricted, at least in its adolescent stages, to the Coniferæ. It appears early in the Spring and preys upon pine-boring Scolytidæ.

*Clerus thoracicus* Oliv. is quite common in this vicinity, occurring on a variety of deciduous trees during May and June. I have bred specimens from the following: Pear tree February 11th and March 2d; Butternut, March 18th; Chestnut, May 1st to 14th; Willow, April 8th. This species is undoubtedly predaceous, and I suspect lives at the expense of various Cerambycid larvæ. One specimen reared from a Chestnut twig, attacked and made a meal off the abdomen of an *Anthaxia*, which had bred from the same wood.

Unfortunately, I have not preserved good specimens of the larvæ. Full grown specimens are about a quarter of an inch in length, of a nearly uniform purplish hue, hairy, and the thorax is ornamented by two dark spots. The last segment terminates in two corneous appendages of a dark brown color.

When full grown the larva forms a burrow, often in the disused gallery of some Longicorn, or other wood borer, lining it with a silvery silken substance. One of these burrows in my possession measures 80 mm. in length and 2-3 mm. in diameter.

The pupa, like others of the family that have come under my notice, does not exhibit the characteristic structural features of the adult insect. One larva taken March 10th had assumed the pupal stage on the 23d, and became a perfect insect April 8th.

*Thaneroclerus sanguineus* Say, has similar habits to the foregoing. One specimen was found dormant in a burrow which it had constructed in the dead wood of an Oak, March 27th; another was taken from dead Maple wood, May 9th, both at Ithaca, N. Y. Two examples were found by Mr. G. W. J. Angell at Rangeley Lakes, Maine, May 20th, on a pile of cut Birch, one of them taken from the wood.

*Hydnocera unifasciata* Say.—Taken on Chestnut and Tulip trees July 6th to 20th.

*H. humeralis* Say.—Occurs in numbers on the common Bay berry (*Myrica cerifera*) at the beaches in the vicinity of New York City—Highland Beach, N. J., Rockaway Beach, L. I., June 18th to July 3d.

*H. pallipennis* Say.—Occurs with *H. unifasciata*, July 24th to September 8th.

*H. verticalis* Say.—Bred from Hickory twigs June 15th to 29th. Occurs on Hickory leaves July 9th to 26th.

*H. longicollis* Ziegl.—Bred from a larva found under the bark of Witch-hazel (*Hamamelis virginica*). It was taken from the blind end of a burrow that had been made by some beetle—presumably a Cerambycid—of the size of *Phymatodes variabilis*, and was hemmed in by a layer of castings about half an inch long. The burrow was lined with a silvery substance somewhat like that observed in the burrows of *Clerus thoracicus*. The larva when found, April 26th, was about to pupate; it transformed in confinement May 22d. I have also bred this species from Hickory twigs, and have found the beetles on the leaves of Hickory in July.

*Phyllobænus dislocatus* Say.—Bred from Butternut twigs May 4th. Occurs in this vicinity in June.

*Chariessa pilosa* Forst.—Bred from a larva found in a Hickory twig at South Woodstock, Conn., on October 30th. Imago developed in May. Also taken at Ithaca, June 14th *in copula* on the trunk of a Butternut tree.

*Laricobius erichsoni* Rosen.—Abundant in early Spring on the foliage of White Pines.

SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 110, vol. vi.)

**GAUROTUS** LeConte.

This genus was separated by Dr. LeConte for our common Eastern species *cyanipennis*, and now contains three species readily recognized by the shining green elytra, which are sparsely and weakly punctured in the typical species, more strongly in *abdominalis*, and quite closely and deeply in *cressoni*. The character used to mark the genus in the "Classification," and which we have followed above, is, strictly speaking, confined to *cyanipennis*, i. e. the protuberant mesosternum. Mr. Frederick Blanchard first called attention (Bull. Br. Ent. Soc. vii, p. 108) to the fact that the mesosternum is not at all protruberant in *abdominalis*, and only feebly so in *cressoni*, and the three species might indeed form the types of three genera. We do not find any better character, and the color, fortunately, renders them easy to distinguish and serves to separate them one from another.

**Synopsis.**

- Abdomen black, legs and antennæ pale . . . . . **cyanipennis.**
- Abdomen pale, legs and antennæ pale, except basal joint . . **abdominalis.**
- Abdomen pale, legs bicolored, antennæ piceous; larger species . **cressoni.**

**G. cyanipennis** Say, J. A. P. iii, 1823, p. 423; *ione* Newm., Ent. 1842, p. 30; *leonardi* Hald., Trans. Am. Phil. x, 1847, p. 60; *chalybea* Hald. l. c.; Lec., J. A. P. ser. 2, i, p. 331; *servillei* Serv., Ann. Fr. 1835, p. 214.

Length 9—10 mm. = .36—.40 inch. *Habitat.*—Can., N. H., Mass., N. Y., N. J., Pa., Va., Carolina, Ky., Mich., Ark.

**G. abdominalis** Bland, Proc. Ent. Soc. i, 1862, p. 270.

Length 10 mm. = .40 inch. *Hab.*—N. H., Va., Pa.

**G. cressoni** Bland, l. c. 1864, p. 69.

Length 11 mm. = .44 inch. *Hab.*—Rocky Mts., Col., Nev.

**BELLAMIRA** LeConte.

**B. scalaris** Say, J. A. P., v, 2. 1827, p. 278; Hald., Trans. Am. Phil. x, 1847, p. 65; *coarctatus* Hald., l. c. p. 59; Dej., Cat. 3, ed. p. 380.

Length 19—27 mm. = .76—1.08 inch. *Hab.*—Can., N. H., N. Y., Pa., Mich., N. J., Md., S. W. Va., La.

A large handsome insect, chestnut-brown in color with a long attenuated abdomen, which gives it a wasp-like aspect. The form is very slender, and the elytra strongly sinuate as in the next genus. The last ventral segment in the male is very strongly excavated.

**STRANGALIA** Serville.

The form is elongate in all the species of *Strangalia*, very markedly in all but *sexnotata*, and the last ventral segment of the male is excavated, strongly in all but the last two. The poriferous system of the antennæ is lacking in *delicata*, but is present in the others, and is contained in small, oval, depressed spaces, situated near the tip of the sixth and following joints. The following synopsis is copied from Dr. LeConte's of 1873, with *delicata* the only new species since found, interpolated. It will be noted that the generic characters become weaker in the last species. There is far less variation in color in this genus than in *Acmeops*.

**Synopsis.**

A.—Body very elongate; fifth ventral ♂ very deeply excavated, so as to appear emarginate, lateral lobes thin, expanded; elytra not fasciaté.

Hind tarsi with third joint scarcely emarginate.

Ferruginous, antennæ thicker; elytra more coarsely punctured with pale sutural markings; fourth ventral ♂ with a broad apical impression . . . . . **virilis.**

Hind tarsi with third joint strongly emarginate.

Above testaceous, head sometimes fuscous; antennæ blackish, slender; prothorax with two broad black vittæ; elytra less coarsely punctured, with black marginal spots; beneath usually dark, abdomen sometimes, and legs partly, testaceous . . . . **famelica.**

Black, elytra more coarsely punctured, pale, with margin and suture blackish; tip less acuminate and more distinctly truncate than in the preceding, than which it is much smaller and more slender. **acuminata.**

B.—Body very elongate; fifth ventral ♂ more or less excavated, but not emarginate, lateral lobes not or merely moderately expanded; third joint of hind tarsi emarginate.

Ferruginous, elytra with two transverse testaceous bands each margined with black . . . . . **strigosa.**

Rufo-testaceous; prothorax with two vittæ, elytra with three transverse bands black; hind thighs black at tip; antennæ yellowish. **luteicornis.**

Ferruginous, elytra black . . . . . **bicolor.**

Black, abdomen and legs ferruginous, elytra testaceous, more or less vittate with black . . . . . **delicata.**

C.—Body less elongate, fifth ventral ♂ only triangularly impressed; sixth joint of antennæ without sensitive spot.

Ferruginous, elytra paler, with three large spots extending from the margin nearly to the suture . . . . . **6-notata.**

**S. virilis** Lec.. S. M. C. No. 264, 1873, p. 212.  
Length 15—19 mm. = .60—.76 inch. *Hab.*—Texas.

**S. famelica** Newn., Ent. 1841, p. 68; Hald., Trans. Am. Phil. x, p. 61; *angustata*, Dej., Cat. 3, p. 381; *nigricornis*. Knoch, i. litt; *confluenta*, Hald., l. c.; *solitaria*, Hald., l. c.

Length 13—14 mm. = .52—.56 inch. *Hab.*—Mich., Ia., Ky., Pa., N. Y., N. C., Va., Ga., Ala., Md., Mo., Ohio.

Varies entirely black, also entirely pale, with the antennæ and parts of the legs dark. Specimens of *luteicornis* sometimes are called by this name when the elytral bands are incomplete, but the two species may be separated by the color of the antennæ instantly, which is black or nearly so in *famelica* and always pale in *luteicornis*.

**S. acuminata** Oliv., 1795, Ent. iv, 73, p. 20, t. 3, fig. 35; Lec., J. A. P. ser. 2, 1, 1850, p. 330; *emaciata* Newn., Ent. p. 68; *necydaloides*, Knoch, i. litt.

Length 8—9 mm. = .32—.36 inch. *Hab.*—Ct., N. Y., N. J., Pa.

Varies entirely black.

**S. strigosa** Newn., 1841, l. c. p. 69; Hald., Proc. Ac. Phil. iv, p. 175.

Length 16 mm. = .64 inch. *Hab.*—Florida.

**S. luteicornis** Fab., Syst. Ent. 1775, p. 197; Oliv., Ent. iv, 73, p. 20, t. 3, fig. 34; Hald., Trans. Am. Phil. x, p. 61.

Length 9—13 mm. = .36—.52 inch. *Hab.*—N. Y., Pa., Va., N. C., Ga., Fla., Ky., Mass., La., Can., Md., Ohio.

**S. bicolor** Sweder. Vet. Ac. Nya. Handl. viii, 1787, p. 197; Say, J. A. P. iii, p. 418.

Length 12—14 mm. = .48—.56 inch. *Hab.*—Mich., Ky., Ohio, Pa., Ga., Va., N. Y., Ala., Can. W.

**S. delicata** Lec., 1874, Trans. Am. Ent. Soc. v, p. 97.

Length 12 mm. = .48 inch. *Hab.*—Cal., Nev.

**S. sexnotata** Hald., 1847, l. c.

Length 8—13 mm. = .32—.52 inch. *Hab.*—Ga., Fla., Tex., N. Mex., Mass.

#### TYPOCERUS LeConte.

This genus contains a number of species exactly like *Leptura* in general form and in coloring, but differing by the large, impressed, poriferous spaces on the antennæ. The following synopsis follows that of Dr. LeConte (S. M. C. No. 264, p. 213), and includes the species since described.

#### Synopsis.

A.—Antennæ black, with sixth and following joints with impressed poriferous spaces; prothorax not strongly rounded on the sides.

Prothorax very coarsely punctured.

Prothorax margined before and behind with golden hair, legs ferruginous.

Elytra acutely acuminate, with indistinct yellow bands; prothorax narrowed from the base, sides subsinuate . . . . . **badius.**

Elytra less acutely acuminate, black with three bands and two basal spots yellow . . . . . **zebratus.**

Prothorax margined with hair at base, legs and antennæ black.

Elytra black, with a broad angulated yellow spot, sometimes divided, extending from the base to the side margin, enclosing the humeral angle and posterior yellow band, often missing . . . **lunatus.**

Elytra black, with basal spot and three transverse bands yellow, the two anterior bands sometimes united at suture . . . **sparsus.**

Prothorax more densely, less coarsely punctured; pubescence golden, denser at base and tip.

Legs ferruginous; elytra brown, with four yellow bands, frequently imperfect or obsolete, tip sub-obliquely truncate and feebly bispinose . . . . . **velutinus.**

Legs black; elytra black, tip obliquely truncate and shortly acuminate. **lugubris.**

B.—Antennæ brown; prothorax strongly punctured, much rounded on the sides before the middle; elytra with four yellow bands, more or less confluent, the anterior basal, the second and third frequently connected near suture, tip subtruncate, not spinose; legs ferruginous.

Antennæ stouter, the sixth joint with large impression in ♂; elytra more shining . . . . . **brunnicornis.**

Antennæ more slender, joints 3—5 longer, sixth without impression in either sex . . . . . **sinuatus.**

C.—Antennæ black ♂, partly yellow ♀; prothorax strongly punctured, much rounded on the sides before the middle; elytra yellow, with base and tip and three narrow bands black, often imperfect, tip subtruncate; legs yellow . . . . . **balteatus.**

**T. badius** Newn., Ent. 1841, p. 69.

Length 13 mm. = .52 inch. *Hab.*—Fla., Ga., N. C., Ala.

**T. zebratus** Fab., 1801, Syst. El. ii, p. 364; Lec., J. A. T. P. ser. 2, 1 p. 334; *aurigera* Newn., Ent. p. 70.

Length 10—13 mm. = .40—.52 inch. *Hab.*—Fla.; Ga., N. C., N. Y., Pa.

This species is often confused with *Leptura zebra*, from which it may be readily separated by the prothorax being only impressed at base, while in *L. zebra* it is deeply excavated.

**T. sparsus** Lec., Proc. Am. Phil. Soc. 1878, xvii, p. 614.

Length 9—10 mm. = .36—.40 inch. *Hab.*—Mich., L. Sup., Wis., Ohio.

**T. lunatus** Fab., 1801, l. c. p. 360; Hald., Trans. Am. Phil. x, p. 63; *arcuata* Oliv., Ent. 1795, iv, 73, p. 32, t. 4, fig. 49.

Length 9—10 mm. = .36—.40 inch. *Hab.*—Fla., Ga., N. C., Texas.

**T. velutinus** Oliv., 1795, Ent. iv, l, c.; Hald., l. c.; *fugas* Fab., 1798, Syst. Ent. Suppl. p. 153; Hald., Proc. Ac. Phil. iv, p. 375; *rhois* Forst. i. litt.; Schön, Syn. Ins. i, 3, p. 485, not. g; *tenuior* Ky., Fn. Bor. Am. iv, p. 181; *nobilis* Newn., Ent. p. 67.

Length 10—14 mm. = .40—.56 inch. *Hab.*—Ga., Fla., Va., Pa., N. J., N. Y., N. H., Wis., Dak., Ind. T., Can. W., La., Me., Ohio.

- T. lugubris** Say, 1823, J. A. P. iii, p. 419; Hald.; l. c.  
Length 9—11 mm. = .36—.44 inch. *Hab.*—Ga., N. C., Va., Pa., N. Y.,  
Mich., Ia., Mo. La., Mass., Can. W.
- T. brunnicornis** Lec., S. M. C. No. 264, 1873, p. 214.  
Length 10 mm. = .40 inch. *Hab.*—Texas, Fla., Col., N. Mex.
- T. sinuatus** Newm., 1841, Ent. p. 70,  
Length 10—13 mm. = .40—.52 inch. *Hab.*—Fla., Middle States, Dak.,  
Mont., Kan., Ind. T., Tex., N. Ill., Neb., La., Md., Pa., Col.,  
Mass., Mo., S. W. Va.
- T. balteatus** Horn, Trans. Am. Ent. Soc. vii, 1878, p. 55.  
Length 11—13 mm. = .44—.52 inch. *Hab.*—Col., Ariz., Mont.  
(To be continued.)
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The field meeting of July 4th, at Jamesburg, was fairly well attended, though, owing to the threatening weather, many who had signified their intention of coming were deterred. Twenty-eight persons were present, Philadelphia furnishing the largest contingent. Two large wagons carried the party to the collecting grounds, where they scattered to do such collecting as the damp condition of things would allow. Before separating, however, the party were immortalized by means of the camera and an engineer brought for the purpose. At noon (very promptly) the party reassembled to discuss the goods provided by the intelligent efforts of the committee (how from the writer as one of them), and it was noted that the dampness complained of as a bar to good collecting shifted its location, and as the external circumstances became dry, the internal wetness was not complained of. After the party had been again photographed—Dr. Skinner officiating at the milk-pitcher—the meeting organized by the election of Dr. George H. Horn, of Philadelphia, as President and Prof. J. B. Smith as Secretary. The Secretary's address was spoilt by the fact that at the most interesting period a young woman passed through the camp on her way to a Sunday-school picnic and so distracted the attention of all concerned (except the presiding officer) that the peroration came to an untimely end. It is beyond the power of the Secretary to give an accurate record of all that was done and perhaps it is well he should not; but the following were appointed as a committee to arrange for future meetings. For the Am. Ent. Soc., Dr. Skinner; for the Feltman Club, Mr. Wenzel; for the Newark Society, Mr. Machesney; for the Brooklyn Society, Prof. Smith. The further proceedings were informal and not to be recorded.—J. B. SMITH, *Secretary*.

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## THE NORTH AMERICAN EUSTROTIINI.

BY A. RADCLIFFE GROTE, A. M.

The rather small sized, slender *Noctuidæ*, Boisduval's *Noctuo-phalenidæ*, which I have included in the Revised Check List under the tribe *Eustrotiini*, seem well placed low down in the *Noctuinæ*, since in several particulars and in their geometriform larvæ, which are 12- to 14-footed, they approach the *Catocalinæ*. The eyes are naked, and this feature is characteristic of the lower *Noctuidæ* and the *Geometridæ*, in which latter a single genus has hairy eyes so far as I am aware. The slender body is rather sparsely clothed with a mixed vestiture, sometimes mealy. The wings are rather weak, the primaries with the external margin comparatively straight and sometimes noticeably short, the hind wings full and rounded. Several genera have a marked tortriciform appearance, these are *Erotyla* (= *Agrophila*), of Europe, and *Fruva*, *Xanthoptera*, *Spragueia*, of our fauna. In the Revised Check List I have commenced the series with the genera having a clypeal protuberance, or an embossed front. In the first genus, *Azenia*, the armature of the head is disproportionately large. There is a tendency in the tortriciform genera which follow, to have the clypeus rugose or globose, the infra-clypeal plate prominent, so that there seems a reason for the arrangement there adopted; these frontal characters seem to gradually vanish in the other genera of the tribe, though the front is often swollen. All of the genera I have seen have the legs somewhat weak, and, so far as I am aware, the tibiæ unarmed.

The neuration affords certain plastic characteristics by which we may separate the genera. On the hind wings vein 5 is variably

strong, sometimes wanting. On the fore wings the accessory cell is usually present, and differences are presented in the length and point of origin of veins 7 to 9. But the neuration of all the genera is not yet known. So far as my conclusions go we must, as yet, hesitate to accord too great value to neurational characters in classifying the moths as a whole. All characters must be used in classification, but we are not in a position, evidently, to make the neuration the crucial test. It is a general guide, but no more than a guide, to find the most natural position for a genus; keeping it alone in sight we may stray from the ends we propose to reach in arranging the objects of our studies.

Gen. **AZENIA** Grt. (1882)

Form very robust, like *Spragueia*, the wings long, primaries widening a little outwardly. Eyes naked. Labial palpi closely scaled, rather thick in appearance, a little longer than in *Xanthoptera*, lying obliquely across the face, hardly exceeding the clypeal projection. This latter very large, overshadowing the infra-clypeal plate, flattened, trilobed. Legs unarmed and thinly scaled. Two small, yellow Western species, having the facies of *Xanthoptera*.

1. **Azenia implora** Grt., Papilio, ii, 186.

Pale lemon-yellow; two ochrey dots in place of t. a. line. A median ochrey shade band, irregular and faint; one or two dots in place of t. p. line; minute points at base of the pale fringes. Hind wings white. Beneath whitish; costa of fore wings a little clouded. Head and thorax above like fore wings in color; the clypeal projection is distinctly tridentate. Abdomen pale, a little exceeding secondaries.

Arizona. Type in coll. Neumoegen.

2. **Azenia edentata** Grt., Can. Ent. xv, 25.

Dark yellow; fore wings with no apparent markings, except a small costal dot; fringes concolorous. Hind wings fuscous. Beneath yellowish; the fore wings darker shaded, and with a fuscous subterminal band. Thorax and head above dark yellow. The clypeal projection has its outer edge roundedly scalloped instead of forming three pointed teeth as in *implora*. Size small, like *implora*.

Arizona. Type in coll. Neumoegen.

Gen. **ESCARIA** Grt. (1882)

The wings are frail and rather wide, form like *Eustrotia* (*Erastria*), the body slender, with untufted abdomen. Eyes naked; labial

palpi short. Front with a moderately prominent, rather wide, cup-shaped projection, nearly hidden by the erect vestiture, and with a central protuberance, not reaching beyond the rim of the cup, set in erect vestiture, which fills the cup itself. (The clypeal projections are thus evidently modifications of the clypeal surface. So far as I have observed they are not sexual peculiarities in the moths). Vestiture mixed, flattened hair and scales. The single species is of the size of *Eustrotia carneola*.

1. **Escaria clauda** Grt., Papilio ii, 186.

Grayish fuscous. In the male the ornamentation is better written. Orbicular paler, spherical; claviform moderate, its upper edge accentuated in black. Reniform lunate, moderate; the lines fine, perpendicular, edged with pale or whitish, especially in the female, which is darker, and the white s. t. line quite prominent. Hind wings pale fuscous, trace of median spot and extra mesial line. A vague terminal band. Beneath grayish fuscous, with common line and faint discal spots. One specimen, probably a variety, showed a reddish cast. Expanse 29 mil.

Arizona. Types in coll. Neumoegen.

The structure of the genera *Fruva* Grt., which is nearest to the European genus *Erotyla* in character, although in ornamentation the American genus *Spragueia* Grt. more nearly accords with the European *Erotyla trabealis* Sc. (= *sulphuralis* Linn.) *Xanthoptera* Guen., *Spragueia* Grt., and *Exyra* Grt., has been explained by me in Can. Ent. xi, 231, and need not be repeated here.

#### Gen. **PROTHYMIA** Hüb.

The palpi are curved and pointed, exceeding the front, the terminal joint long and attenuate. The fore wings have the external margin somewhat rounded; hind wings full. The abdomen is slightly flattened. These characters are drawn from the European *P. viridaria*, and to this genus the late Mr. Morrison referred two species from eastern North America, viz.: 1, *coccineifascia* Grt.; 2, *rosalba* Grt.; while I have described 3, *plana* Grt. from Arizona; and 4, *orgyie* Grt. from Texas. Of these *plana* resembles, in ornamentation, the European *Metoponia kekkeritziana* Hüb. I have not been able to compare the two insects.

#### Gen. **EUHERRICHIA** Grt. (1882)

This genus has the form of *Eustrotia*, but the purple colors of *Callopietria* (*Eriopus*), to which Hadenoid genus Guenée referred our North American species. Dr. Herrich-Schaeffer, in his "Cor-

respondenz Blatt," first showed that Guenée had mistakenly classified our species, while I have described what I consider a true *Caloptistria*, *C. strena* Grt., from Florida, congeneric with the European *purpureofascia* (= *pteridis* Fab.) and *latreillei*. The form is slender; the abdomen not exceeding the secondaries, tufted on the dorsal line at base, and especially on the third segment. Eyes naked; vestiture mixed, flattened scales and hairy. The wings are rather broad, entire; apices of primaries somewhat pointed, outer margin a little sinuate below apices, rounded submedially. Primaries 12-veined; accessory cell present; 9 out of 8 to apex, about half the length of 8; cell open; 3 twice further from 4 than 4 from 5 at base. Hind wings 8-veined; cell open; 3 and 4 arising together from extremity of submedian vein; 5 a little weaker, removed at base for about one-fifth the breadth of cell, indistinctly connected. The type is *monetifera* Guen., a well known species from eastern North America, with bright brown primaries, prettily flashed with silver. Other species are purply brown, sometimes with silvery lines.

Gen. **EUSTROTIA** Hüb.

Not only has this term priority over *Erastria* Treits., but *Erastria* is also previously used by Hübner for a genus of *Geometridæ*. The abdomen shows usually some dorsal tuftings. The fore wings are somewhat triangular, hind wings full. The accessory cell is present, and the genus shows neurational affinities with *Euherrichia*. In the Revised Check List I have referred sixteen North American species to this genus, some of which may be here briefly mentioned. Of the pale, bone-colored species, the types of *malaca* and *mitographa* are in coll. Am. Ent. Soc. Since I have not seen them again, nor have I examined other specimens, they should be re-examined. The ornamentation of *mitographa* is peculiar. Most numerous are the black and carneous-brown, typical species belonging to the *apicosa* (= *nigritula*) group. I have had my doubts whether *synochitis* is or is not the species figured and described by Guenée as *olivula*. Certainly the figure in the "Species Général" indifferently corresponds, and the description does not agree sufficiently. I have not been able to see Guenée's type.

Gen. **THALPOCHARES** Led.

This genus, so largely represented in Europe, has but few described North American species. It differs from *Eustrotia* by the neuration, there being no accessory cell on the primaries. A typical species appears to me to be *Thalpochares ætheria* Grt., (N. Am.

Ent. i, 47) from Florida. The other species enumerated by me in the Revised Check List have been incompletely studied as to the neurulation. The species are most numerous in the south of Europe, where they are found on chalky or sandy districts, and it is related as characteristic of their habits, that, when alighting, after being disturbed in the daytime, they move their wings up and down several times before assuming a position of repose.

The European genera *Phothedes* Led., *Mesotrosta* Led., *Hæmerosia* Boisd., *Megalodes* Guen., with single species, have not been as yet recognized in North America. The tribe is represented in the European fauna by nine genera and forty-six species. In the Revised Check List I have given the names of sixteen genera and seventy-three North American species of *Eustrotiini*.

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### Mode of Oviposition of certain species of Odonata.

BY WM. BEUTENMULLER.

The female of *Libellula*, when laying eggs, hovers over the surface of the water and in coming in close proximity to the same, balances herself by the very rapid motion of her wings, curves her body downward and dips the tip of her abdomen into the water at short intervals, at the same time deposits from 25 to 40 eggs, which are surrounded by an invisible glutinous substance secreted at oviposition by means of which they adhere to aquatic plants, sticks, stones, or any other object they may come in contact with at the bottom of the water. In order to ascertain the number of eggs laid at each time the female *Libellula* dips her abdomen into the water, I captured at different times several specimens of *Libellula auripennis* and *L. pulchella* in act of ovipositing and held together their fore wing, allowing the hind wing to remain free and in action while I dipped the tip of their abdomen into a small vial filled with water and invariably at each dip about the same number of eggs as alluded to above were deposited. This experiment was repeated until the supply of eggs of my specimen for the time being was exhausted and the results were always the same.

The eggs leave the orifice of the oviduct in rapid succession, and are withheld in a bunch in the shallow depression at the tip of the abdomen until the same comes in contact with the water, then the eggs become separated while sinking, but become concentrated again at the bottom of the water by means of the glutinous substance which surrounds them.

As regards my observation on the mode of oviposition of *Li-*

*bellula* they agree with those made by Siebold (Germ. Zeit. Ent. ii, p. 421). The male of *Libellula*, it is stated by Siebold, retains its hold to the female and directs her movements while ovipositing. Müller (Ent. Mon. Mag. viii, p. 127) notices the method of oviposition of *L. flavicola* and confirms the assertions made by Siebold.

Although I have seen scores of *L. pulchella*, *L. auripennis*, *L. semifascia*, and many other species in the act of oviposition, the females were always destitute of the males, and only in one instance I saw a male retain its hold on the female while laying her eggs. The egg of *Libellula auripennis* is irregularly oval with very fine granulations, sordid white and semi-translucent, becoming amber-yellow before the young larva emerges. Length,  $\frac{1}{3}$  mm.; width,  $\frac{1}{4}$  mm. A number of eggs which were laid on July 23d, at 6.30 P.M., disclosed the young larvæ on August 1st. The egg of *Libellula pulchella* is very similar to that of *L. auripennis*, in fact cannot be distinguished from it, except that it is a little more irregular in shape. Length,  $\frac{1}{3}$  mm., width,  $\frac{1}{4}$  mm. Laid July 23d at 6 P.M. Young larva emerged July 30th.

The mode of oviposition of *Platythemis* (*P. trimaculata*) and *Diplax* (*D. berenice* and *D. rubicundula*) is identical with that of *Libellula*. The egg of the former is elliptical, or sub-elliptical, granulated, semi-translucent, pale yellowish white granulated, and before hatching becomes amber-yellow. Length,  $\frac{1}{2}$  mm.; width,  $\frac{1}{3}$  mm. Laid July 13th at 5 P.M. Young larva emerged July 23d. The eggs of the two latter species are oval, yellowish white, semi-translucent, and slightly granulated. Length,  $\frac{1}{2}$  mm.; width,  $\frac{3}{6}$  mm. Laid August 12th. Young larva emerged August 22d. The habits of *Calopteryx*, *Agrion* and *Lestes*, differ entirely from that of *Libellula*. They deposit their eggs in a groove made by the ovipositors along the stems of water plants. Both *Agrion* and *Lestes* sometimes go beneath the water to lay their eggs.

Siebold (Wieg. Archiv. pt. 1, p. 205, 1841) observed a female *Æschna* clinging to a plant dipping her body beneath the water and rubbing it up and down along the stem. Mr. W. T. Davis once saw a female *Æschna verticalis* go below the surface of a slow flowing spring, but has not seen the species deposit an egg, as is stated in one of the volumes of the "Zoölogical Record." I have seen at Sandy Hook, N. J., a species of *Æschna* laying eggs in the same manner as *Libellula* with the male directing her movements.

The best time I found to make observations and to capture the different species of *Odonata* is between sunset and dusk, or on a day partly clouded.

## NOTES ON THE HABITS OF SOME SPECIES OF RHYNCHOPHORA.

BY FRANK H. CHITTENDEN.

In preparing the following notes my aim has been to record facts that are new, or comparatively so, regarding the food habits of certain of our Rhynchoporous Coleoptera. I find several other writers have recorded observations similar to my own, but so little has been written concerning the habits of this group that I have concluded to publish the results of my own personal observations, trusting that they will lose little of value by repetition, but may, on the contrary, serve in a measure to corroborate observations previously published. At the same time I have deemed it advisable in some instances to mention briefly in connection with my own notes certain facts that have been published elsewhere.

Very little is known concerning the early stages of the Rhynchophora, but the frequent occurrence of the imagines on plants of a particular genus or order, though not conclusive evidence that such constitute the food of the larvæ, is at least highly suggestive and worth recording.

In very many instances that have come to my notice the finding of a few specimens of a species of weevil under certain conditions on a plant, point to it as a probable food-plant; the discovery even of a single individual—*e. g.* a female in the act of depositing her eggs, or of a pair of beetles copulating on a plant is well worth noting down, as the repetition of such occurrence may be taken as more than mere presumptive evidence that the same plant serves as food for the larvæ. The finding of the first specimen is followed by another and another until at last that, which was at first a suspicion, becomes an established fact.

As few weevils are short lived, and not so restricted as some beetles appear to be in the time of their appearance and disappearance, I have, in the majority of cases, simply recorded the dates in months. The greater part of these observations were made at Ithaca, N. Y., and the remainder in the neighborhood of New York City.

*Eugnamptus angustatus* Hbst. and *E. collaris* Fab., I have several times taken together while beating butternut trees, also on chestnut, and on hickory *in copula* July 10th to August 7th. These two forms are usually found together, and are quite generally believed to be identical.

*Phyxelis rigidus* Say hibernates under piles of weeds and rub-

bish in fields and gardens, where it may be found early in Spring and late in the Autumn. I have always supposed that this species bred in some common weed.

*Pandeletejus hilaris* Hbst. is common on beech trees in June, a few pairs observed *in copula* at this time. According to Harris the larvæ live in the trunks of the white oak.

*Scythropus elegans* Coup. appears sometimes in great abundance in the latter part of April continuing in constantly decreasing numbers into the middle of July, upon the foliage of pine trees, occurring most commonly at Ithaca, N. Y., on the white pine (*Pinus strobus*). Individuals from a single locality exhibit a great variety of coloration. In the great majority the normal ground color is a rather bright fawn, tinged with a more or less coppery lustre, some are decidedly cupreous, even brilliant, inclining to a pinkish hue, and others are of an equally brilliant metallic green. In specimens taken late in the season the scales which produce this variety of coloring have been worn off, or have faded, leaving the body a nearly uniform dull cinereous. In such individuals the humeri have become denuded, and the ground color is then much the same as the sutures, which are normally nearly white. One specimen taken early in the season retains its deciduous mandibular appendages.

*Ithycerus noveboracensis* Sch. is known to breed in the twigs of bur-oak, and the beetle is injurious to the buds of a variety of fruit and forest trees. All the specimens that I have ever taken were on beeches, and I suspect that this is a favorite food-plant for both larvæ and beetles. Mr. W. H. Harrington states (Ann. Rep. Ent. Soc! Ont. for 1880, p. 52) that he has frequently found the beetle on beeches in June, the sexes copulating at this time. It also occurs in May and July.

*Apion nigrum* Hbst. occurs quite commonly on the leaves of the locust (*Robinia pseudacacia*). The leaves are often seen riddled with minute holes, and as the *Apions* and *Agrilus egenus* are the only insects observed by me in any numbers on this tree, and the former occur in the greatest abundance the blame naturally attaches to them. July.

*A. rostrum* Say occurs literally in thousands on *Baptisia tinctoria*, the wild indigo plant, and according to LeConte (Rhynch. of America North of Mexico, p. 411) on *B. leucantha* also. It may be found in this neighborhood in May and June.

*Apion fraternum* Smith, I have observed sometimes in great numbers on the leaves of two species or varieties of *Lespedeza*. July and August.

*Listronotus*. During the past year Mr. C. M. Weed has published an account of the life-history of *L. latiusculus* Boh., which he found in all stages of growth in the stalks and seed-heads of *Sagittaria variabilis*. Some six years ago, while sweeping a small patch of aquatic plants composed almost entirely of this species and a few specimens of a species of *Carex*, I took *tuberosus* Lec. (July and August), *caudatus* Say (July), and *appendiculatus* one pair *in copula* (June, July and August). The last named species I have recently observed on the flower-heads of *Sagittaria*. The habits of all these species are doubtless very similar. Mr. William Juelich has found *appendiculatus* breeding in the lower parts of the stems of some species of reed.

*Eudocimus mannerheimii* Boh., a rare species, has not been taken in this vicinity to my knowledge for many years. It once occurred, so Mr. Juelich tells me, rather abundantly in the neighborhood of Hoboken, N. J., under the bark of the swamp cedars.

*Lixus concavus* Say, I have usually taken on a common broad leaved variety of dock (*Rumex*), and less often on rhubarb. As others have made the same observations, I think it more than likely that the species breeds in the stems of both as well as in *Helianthus* and *Chenopodium* as stated elsewhere (F. M. Webster, ENT. AM. vol. v, p. 11). The rosin-weed (*Silphium*) is also mentioned as a possible food-plant.

*Barytychius discoideus* Lec. Several specimens taken years ago on a small, low and rather common weed, species not determined. May 28th to July 11th.

*Otidoccephalus chevrolatii* Horn. A single specimen was found in a jar in which had been placed a piece of basswood that had been attacked by some species of borers. It is a matter of doubt whether the insect actually bred from the wood or had simply crawled into some hole or crevice to hibernate. I have taken the adult insects while beating hickories and chestnuts during the past July. An allied species, *O. laevicollis* Horn, has been hatched by Dr. C. V. Riley from the galls of a Cynipid on oak.

*Magdalis olyra* Hbst. breeds often in abundance under the bark of hickory trees, the larvæ subsisting on the inner bark. I have seen a branch about four inches in diameter infested in fully eight feet of its length by this species. Some four feet or more of the bark had been loosened, exposing the wood. There was scarcely a space larger than the tip of one's finger on this branch that was not completely riddled with the little round holes bored by the weevils in their egress through the bark, and I counted in one case a dozen

such holes to a square inch of surface. The larval mines, as observable on the inner side of the bark, are longitudinal, sinuous and only moderately irregular. In specimens that have been preserved there were so many larvæ at work that their tunnels sometimes crossed and recrossed, and were at times interrupted by burrows made by *Chrysobothris femorata*, so that individual mines could with extreme difficulty be traced throughout their entire length. The bark was almost entirely free from the wood, a layer of sawdust-like castings, nearly as hard as chalk, and an eighth of an inch thick, intervening.

There was evidence that a large proportion of the larvæ had been destroyed by a Hymenopterous parasite, and that many had fallen prey to woodpeckers. The beetles occurred last year at Staten Island, on hickories, in May.

*Magdalis hispidoides* Lec. Bred from larvæ found February 22d, in a twig of pitch pine (*Pinus rigida*), under the bark. They so closely resemble the larvæ of *Magdalis armicollis*, figured in Le Baron's Fourth Ills. Rep't., that I had no difficulty in identifying them as of this genus. The pupa was first observed March 7th. On the 28th the pupa was found with the mandibles and eyes black, rostrum reddish and caudal half of elytra dark. April 1st it had transformed. The head, eyes and dorsal surface were red, elytra uncolored and ventral surface pale. On the following day the imago appeared perfectly colored. My observations indicate the duration of the pupal stage as about four weeks. The perfect insect occurs on the branches or foliage of pines in June and July, one specimen being taken as early as the 21st of May.

*Orchestes pallicornis* Say and *O. niger* Horn were taken together in July on the leaves of low willows.

*Gymnetron teter* Fab., the common mullein weevil, I have taken from the seeds in which it breeds in September; sometimes nearly every seed conceals its little occupant. The beetle occurs on the plant in June and July.

*Conotrachelus juglandis* Lec. breeds in the green fruit of the butternut, in the same way that its congener, *C. nenuphar* breeds in plums and cherries. It is said to occur also on the walnut. May to October. Other species of the genus are known to live at the expense of deciduous trees. *C. seniculus* Lec., *elegans* Say and *posticatus* Boh., I have beaten from forest trees, but as I have taken none of them in abundance my notes are not of a character to warrant any conjectures regarding their food-habits.

*Rhyssematus lineaticollis* Say is on record as breeding in the

seed-pods of *Asclepias tuberosa* and *incarnata*. I have twice had occasion to observe the adult insect with rostrum deeply imbedded in the stalk of the milkweed, and have kept specimens in confinement feeding upon the juice of the same. May, June and July.

*Cryptorhynchus bisignatus* Say. Several specimens taken in the latter part of May at Clifton, N. J., on a chestnut log infested with *Leptostylus macula*, and during the last part of June fifteen or sixteen examples were found on another log of chestnut, some of them copulating; also taken on the trunk of a living beech tree infested with Scolytids. It is probable that this species has similar habits to *C. parochus*, living under the bark of chestnut and possibly beech.

*C. parochus* Hbst. is known to breed under butternut bark, which appears to be its favorite food tree. Though I have taken this insect often during several years it was always on butternut. April and May.

*Acoptus suturalis* Lec. lives in the dead wood of beech trees. I have found the imagines in the wood March 27th to April 20th in company with larvæ apparently of the same species. One of these larvæ taken May 26th appeared about to pupate. The beetles were crawling on the trunk of the tree early in July.

*Mononychus vulpeculus* Germ. breeds in the seed-pods of the blue flag (*Iris versicolor*), the beetle issuing in the fall. The perfect insect occurs in the flowers of the blue flag and the common crane's bill (*Geranium maculatum*) in May and June. It has been stated (v. Say, LeConte, ed. p. 286) to occur on the flowers of *Ceanothus americanus* and *Verbascum thapsus*.

*Cæliodes flavicaudis* Boh. occurs in the greatest abundance on the common nettle (*Urtica dioica*) in May, June and July.

*C. acephalus* Say is also abundant along the coast of New Jersey on the evening primrose (*Oenothera biennis*). June, July and August.

*Ceutorhynchus septentrionalis* Gyll. is another common species sometimes found in swarms on the wild mustard (*Sisymbrium officinale*).

*Rhinoncus pyrrhopus* Lec. A pair of these little beetles were taken *in coitu* on a common species of dock (*Rumex*), and being confined in a small vial with a part of a dock leaf consumed it almost entirely within a week. The species has also been observed by Mr. M. L. Linell on a species of *Rumex*. June.

*Centrinus lincicollis* Lec. A number of specimens were taken at one time on the New Jersey tea plant (*Ceanothus americanus*) July 9th.

*Balaninus*. The recent publication of Dr. John Hamilton on the food habits of the genus leave little for me to add, but a few lines on my experience may be of interest.

*B. uniformis* Lec. and *B. quercus* Horn were taken in company in nearly equal numbers, and almost invariably *in coitu* upon acorns during September. From finding them on only two trees in separate groves of oaks I was led to believe that they favored particular varieties or species, if not individual trees. On almost every acorn on these two trees a pair, and sometimes two pairs were found, while the surrounding oaks yielded not a single specimen.

*B. rectus* Say I have bred from chestnuts. A few infested nuts were placed in a small, wide-mouthed bottle nearly filled with coarse sandy soil. A few days afterward three larvæ deserted their old homes and at once penetrated to the bottom of the breeding-bottle, where they formed little round cells in the earth. Here through the glass their bodies were plainly visible, where they remained without change till the following fall. They thus passed nearly a year as inactive larvæ. The pupa were not seen at all, and this stage must necessarily be of brief duration. The beetles, in good healthy condition, were taken from their earthen cells September 28th and kept without food till October 20th. As many as six half-grown larvæ were taken from a single chestnut, though one specimen is the usual number. The larvæ of all three species may be found in the nuts as late as November, at which time they enter the ground to undergo their transformations.

*Dryophthorus corticalis* develops under the bark of *Pinus rigida* March and April.

*Himatium conicum* Lec. One specimen was taken by me at South Woodstock, Conn., October 22d, under bark of *Pinus strobus* infested by *Tomicus pini*. Mr. E. A. Schwarz (Pr. Ent. Soc. Wash. vol. i, p. 233) has found this species breeding under tulip bark (*Liriodendron*), and our other species, *errans*, which he remarks, is with difficulty to be distinguished from it, occurs under pine bark. Is it possible that the two species are distinct?

*Rhyncholus brunneus* Mann. is possessed of similar habits to *Phlæophagus* and *Stenoscelis*, of which mention has been made in a previous number (p. 99). I have found it only once, but at that time some twenty-five or thirty specimens were taken from a small piece of cherry wood (*Prunus serotina*). April.

The species of *Cossonus* are subcortical. *C. concinnus* Boh. and *corticola* Say infest pines, often occurring in abundance. July.

## NEW SPECIES OF ARCTIANS.

BY B. NEUMOEGEN.

**Arctia favorita** n. sp.—Antennæ rather short, brownish black. Head, collar, prothorax, thorax and patagiæ of coral-red, with the three usual black longitudinal stripes on patagiæ and thorax, the two black spots on prothorax and the black dot on head between base of antennæ. Body coral-red, with a black dorsal line and a lateral row of small black dots. Legs yellowish red, with black maculations at joints. Beneath, thorax and abdomen with lighter coral, the latter having black segmentary stripes. Legs blackish. Primaries black, with the following maculations in straw-yellow; a broad horizontal line running parallel with inner margin from base to outer margin and forking at anal angle. Between this line and inner margin, appending to the former, three irregular spots. Two transverse lines starting from costa, joining and resting on horizontal line, thus enclosing discal spot. Between anterior transverse line and outer margin the usual zigzag line from costa to horizontal line. A few irregular dots on costa between base and interior transverse line; inner margin fringed coral; outer margin has fringes of straw-yellow. All these maculations of straw-yellow show invariably a centre line of beautiful bright coral color. Secondaries bright coral with paler fringes; a black discal spot; three large black submarginal spots from apex to anal angle, the centre spot being largest. Broad black band along costa and outer margin, being toothed between submarginal spots. Beneath, primaries and secondaries as above. Expanse of wings 35—40 mm. Length of body 13—14 mm.

*Hab.*—Idaho Springs, Colorado. Types, two males; coll. B. Neumoegen; caught by Mr. D. Bruce.

This insect belongs to the *autholea* group, and, aside from its own peculiarities, is easily distinguishable by its bright coral centre lines.

**Euchætes conspicua** n. sp.—Head and collar brick-red. Prothorax, thorax and patagiæ light gray; marginal lines of thorax and patagiæ brick-red. Abdomen deep orange, with faint traces of black dorsal dots and black lateral dots. Beneath, abdomen as well as the legs of light gray. Primaries and secondaries light gray; fringes concolorous. On primaries along costa and inner margin a conspicuous line of bright brick-red, terminating within apex and anal angle respectively; a faint hue of brick-red along anal margin of secondaries. Beneath as above, with a slight fringe of brick-red at base. Expanse of wings 30 mm. Length of body 9 mm.

*Hab.*—Golden, Colorado. Types, two males; coll. B. Neumoegen; caught by Mr. D. Bruce.

This insect comes near *E. cadaverosa* Grote. It is easily recognized by its conspicuous costal lines. *E. cadaverosa* is found in Cuba and Texas, whilst this is the Colorado representative.

**Arachnis zuni** n. sp.—Head white; collar light yellow. Prothorax and patagiæ of slate color with black marginal lines. At inner centre of patagiæ

this lines recedes, forming a lunular spot of pure white. Antennæ simple, black below, and alternately black and white above, with white base and black tips. Thorax white, with a broad central band of slate color, fringed with outer black lines, constricted in the middle and forking out at lower part, forming thus an irregular lunular spot of pure white. In the middle of this central band a white irregular dot. Thorax beneath white, with marginal stripes of slate. Legs slate, with irregular white spots, encircled by black rings, at intersection of joints. First joint of coxæ above the largest part of bright yellow, limited by two black cross lines; beneath white. Tibiæ and tarsi white beneath first joints. Abdomen bright yellow, with dorsal and lateral black bands, white beneath. Primaries of slate color, more intense towards base, with the following maculations of pure white. Four of them starting at base of costa and resting on discal vein, consequently becoming larger in size towards apex; all of irregular shape from nearly semicircular degenerating into irregular square. The three blotches nearest base connected by small constrictions. The fourth blotch irregularly square and separate. Between fourth blotch and apex, without touching latter, a large, irregular, crescent band, resting on costa and forming a costal, semilunular spot of slate, having at its inner extremity a large hook, pointed outwardly and resting on first median vein. At outer margin and intersection of veins minute triangular spots. Along outer margin, curving inwardly at centre and swinging from anal angle upward beyond first median nerve, where it tapers off, an irregular dentated band, bulging out above anal angle and touching outer margin. Along inner margin five irregular blotches, the third running across entire interspace and tapering off, touching discal vein. This third blotch is the largest of the five, the two remaining between this and anal angle being only very small, triangular marks. Some small, irregular dots in interspace of median and submedian veins and above basal half of inner margin. All maculations are encircled by black lines. Secondaries white, about one-fourth smaller than primaries, having a tendency to be caudate, and about half as long as abdomen. Along costa and anal margin bright yellow, the hairy tuft of latter quite pronounced in color. A terminal series of slate spots, a discal spot of lunular shape, and a few dots between latter and interspaces of base and outer margin. A large oval spot on costa near apex slate color, encircled by a black ring. Below, primaries and secondaries as above, only that the four costal blotches of primaries are of a slate instead of white, and that on costa of secondaries, instead of one, there are three blotches of slate color, the interspace formed by the two nearest base being bright yellow. The interspace on primaries between costal blotches being equally of bright yellow. Expanse of wings 47 mm. Length of body 18 mm.

*Hab.*—Las Vegas, N. Mexico. Type, one male; coll. B. Neu-moegen; reared from the chrysalis brought home by Mr. H. Mæeske, Autumn, 1889.

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How many broods of the "Elm leaf beetle" are there in the latitude of New York? New Brunswick has positively but one. Some collectors still claim two! Please send in your observations.

## FOOD HABITS OF SOME CHRYSOMELIDÆ.

BY WM. BEUTENMULLER.

*Donacia*.—The various species of this genus occur upon the leaves of aquatic plants, especially water-lilies (*Nymphaea* and *Nuphar*). I have taken *D. palmata*, *D. piscatrix*, *D. subtilis*, *D. femorata*, *D. aequalis* and *D. flavipes* upon these plants. No larva of any American species has yet been described; they undoubtedly have the same habits as the European species which bore in the stems of water-lilies.

*Lema brunnicollis* and *L. collaris*.—Both these species live on the thistle; the former I have taken at Enterprise, Fla., and the latter species was bred by Coquillett (Can. Ent. xv, p. 22).

*Lema solani* and *L. conjuncta* I have found upon the leaves of *Solanum carolinense* at Enterprise, Fla., in May.

*Lema trilineata* lives upon *Datura stramonium*, potato and *Physalis*.

*Crioceris asparagi* and *C. 13-punctata* both feed upon the leaves of asparagus.

*Coscinoptera dominicana* lives in a case on sumac (Harris' Corr. p. 76). The insect has also been beaten from oak, apple, plum and sassafras (Riley, 6th Mo. Rep. p. 127).

*Chlamys plicata*.—I have bred this case bearer from the leaves of blackberry and hazel; also found on sycamore and oak.

*Exema gibber* and *E. conspersa*.—I raised these two species from a narrow leaved species of aster.

*Cryptocephalus 4-maculatus* is found on oak. *C. binomis* I have taken on blackberry in Florida. *C. venustus* also inhabits the blackberry. *C. aulicus* occurs upon a small leaved huckleberry in Florida, as also does *Griburius larvatus*.

*Pachybrachys tridens* feeds on poison ivy (*Rhus toxicodendron*). *P. luridus* may be found on wild indigo (*Baptisia tinctoria*). *P. livens* inhabits the willow. *P. femoratus* has been taken on pine by Mr. Harrington (Can. Ent. xvi, p. 97).

*Bassareus formosus* lives on various species of alder. *B. mammifer* may be found on blackberry.

*Glyptocelis pubescens*.—I have taken this species at Fordham, N. Y., on hemlock; also found on pine (Fitch).

*Chrysochus auratus* occurs in considerable numbers upon the leaves of dog-bane (*Apocynum*). The larva of this common species has not yet been recorded. I have searched for it in vain upon the leaves of the plant the imago infests. Can the larva, perhaps, in some way live upon the roots?

*Tymnes tricolor* may be found on blackberry, hornbeam and various other plants.

*Adoxus vitis* feeds upon Virginian creeper (*Ampelopsis*) and grape.

*Metachroma pallida* has been bred from the leaves of poplar by Coquillett (Can. Ent. xv, p. 21).

*Paria aterrima*, *Graphops pubescens* and *Colaspis brunnea*.—These three species infest the roots of the strawberry.

*Doryphora clivicollis* feeds upon the underside of the leaves of various species of milkweed (*Asclepias*).

*Doryphora 11-lineata*.—The early stages of this species have been described and figured by Duges (Ann. Ent. Soc. Belg. xxviii, p. 1, pl. 1). It feeds on *Solanum tardum* in Mexico.

*Doryphora 10-lineata*.—Besides the well known food-plant (the potato) of this species it has also been found living upon the following plants: egg-plant, *Datura stramonium*, henbane (*Hyoscyamus*), ground-cherry (*Physalis*), apple of Peru (*Nicandra*), tobacco, belladonna, petunia and cabbage (Glover and Riley).

*Doryphora juncta* lives on *Solanum carolinense*.

*Chrysomela multiguttata* feeds on hazel (Coquillett, Can. Ent. xv, 22). *C. scalaris* lives on willow, linden, elm and basswood. *C. philadelphica* and *C. bigsbyana* infest various species of willow.

*Chrysomela similis* was bred from ragweed (*Ambrosia artemisiifolia*) and *Bidens frondosa* by Coquillett (Can. Ent. xv, 22).

*Chrysomela præcelsis* lives on *Ipomea* and *Calystegia* (Hamilton, Can. Ent. xx, p. 66).

*Chrysomela lunata* I have taken this beetle on the leaves of various species of wild roses, upon which the larva also undoubtedly lives.

*Prasocuris phellandrii*.—The food-plant of this beetle has not yet been recorded in this country. In Europe it lives on *Cicuta virosa*.

*Prasocuris varipes* lives on a species of buttercup (*Ranunculus*) in April.

*Gastroidea polygoni* feed upon different species of knotweed (*Polygonum*). *G. cyanea* I bred from *Rumex*. *G. formosa* lives on a species of rhubarb in Arizona.

*Lina tremula*, *L. lapponica*, *L. scripta* and *Phyllodecta vulgatissima*.—All these species infest various species of willow and poplar.

*Monocesta coryli* is injurious to various species of elm (Riley, Rep. U. S. Dept. Agr. p. 246, 1878); also feeds on hazel.

*Agelastica halensis* lives in *Galium verum* in Europe. No record of its food-plants in this country has as yet been made.

*Diabrotica vittata* bores in the stems and roots of pumpkin and squash vines. *D. longicornis* feeds on the roots of corn (Forbes, 2d Rep. Nox. Ins. Ill. p. 55).

*Trirhabda brevicollis*.—I have taken this insect in abundance on prickly ash at Kissimmee, Fla. April.

*Trirhabda tomentosa* lives on various species of golden rod and asters (Beutenmuller, Can. Ent. xxii, p. 36).

*Galeruca xanthomelena*.—This insect infests the elm, blighting the leaves and rendering almost worthless the trees they attacked. The pest within the last three or four years has made its appearance in considerable numbers in New York City, and is doing great mischief to the trees of our avenues and parks.

*Galeruca marginella* lives on *Myrica gale* (Packard Guide, p. 505).

*Galeruca sagittariæ* may be found in June and July in its various stages on the leaves of water-lilies (*Nuphar*) and *Sagittariæ*.

*Galeruca maritima*.—I have taken this insect in abundance on a species of grass found behind the sand-dunes along the sea-shore of Long Island.

*Blepharida rhois* feeds on sumac (Riley, 6th Mo. Rep. p. 118-122).

*Disonycha limbicollis*, *D. pallipes*, *D. punctigera*, *D. pennsylvanica* and *D. rufa*?—I found all these on various species of *Polygonum*. The larvæ undoubtedly also live in some way upon this plant. *D. collaris* was bred by Miss Murtfeldt, from the leaves of *Spinach* and *Chenopodium album* (Bull. No. 22, U. S. Div. Ent. p. 76).

*Haltica chalybea* lives on elm and grape. *H. bimarginata* infests the alder (Lintner, 4th Rep. Nox. Ins. p. 98). *H. foliacea* feeds on apple and hawthorn (Murtfeldt, Insect Life, i, p. 74-76). *H. marevagans* I have bred from evening primrose.

*Crepidodera cucumeris* is found in numbers on the leaves of cucumber, potato and *Datura stramonium*. *C. helxines* live on willow and poplar.

*C. rufipes* was taken by Lintner on apple. I found it on locust last May at Washington, D. C.

*Phyllotreta vittata* may be found on cabbage and other cruciferous plants. *P. zimmermanii* mines the leaves of peppergrass (Riley, Rep. U. S. Dept. Agric. p. 304, 1884). *P. chalybeipennis* mines the leaves of *Cakile americana*.

*Dibolia area* infests the turnip by burrowing in the leaf stems (Comstock, Rep. U. S. Dept. Agric. p. 248. 1879). I also found the insect on the leaves of *Plantago*

*Microrhopala vittata* mines the leaves of golden rod (Harris, Journ. Bost. Soc. Nat. Hist. i, p. 147).

*Odontota rubra* mines the leaves of apple and linden; the perfect insect may also be found on white birch, hornbeam, cherry, juneberry (*Amelanchier*) and *Pyrus arbutifolia*. *O. nervosa* I bred from asters and *Eupatorium*. *O. dorsalis* mines the leaves of locust and acacia.

*Physonota unipunctata* feeds on sunflower (*Monarda fistula*).

*Cassida bivittata*, *C. nigripes*.—Both these species feed on the sweet potato.

*Coptocycla guttata*, *C. aurichalcea* live upon morning-glory and sweet potato. *C. clavata* I bred from a species of nightshade (*Solanum*).

*Chelymorpha argus* is also found on morning-glory and other allied plants.

*Porphyraspis cyanea* I found in considerable numbers on the underside of the leaves of the palmetto at Enterprise, Fla.

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In a series of articles in "Societas Entomologica," Dr. A. Troska gives the results of some very interesting experiments in feeding Lepidopterous pupæ, principally with sugar water. He paints the wing cases and some other parts of the body, carefully avoiding the stigmata, and attains unusually large and fine specimens. Painting with oxide of silver just before development, reduces size and intensifies, while it narrows and defines the maculation. The conclusion is that pupæ take considerable nourishment by endosmosis, and that varieties can be produced by experiment.

It was also found that where the specimens experimented upon were parasitized, the parasites resulting were remarkably fine and large, with brilliant colors, and that they evidently benefitted by the feeding of the host.

## A NEW BOMBYCIA.

BY JOHN B. SMITH.

**Bombycia candida** sp. nov.—Ground color fuscous brown; neck yellow; a black line across middle of thorax. Primaries: basal space largely white, except close to thorax, and at inner margin; median space white powdered in the costal region, and a broad white costal shade beyond t. p. line, narrowing to apex. T. a. line outcurved on costa, then nearly straight to hind margin. T. p. line from middle of costal margin incurved, slightly angulated outwardly on median vein, thence outwardly oblique and sinuate to hind margin about one-quarter from anal angle. S. t. line traceable as a vague whitish shade, preceded by an equally vague blackish shade, except just above the anal angle, where both white and blackish shades are obvious. Beyond the t. p. line there is a rusty shade through the centre of the wing to the outer margin. Narrow, irregular, transverse strigæ are obvious through the dark parts of the wing; a continuous black terminal line; two longitudinal black dashes before apex. Secondaries fuscous to the narrow, irregular median line, beyond which it is more yellowish and marked with blackish, irregular transverse strigæ. Beneath yellowish fuscous, with distinct black discal spots on all wings, mottled with blackish transverse strigæ; primaries darker outwardly. Expands 1.55 inch.; 39 mm.

*Hab.*—Florida.

A single male specimen from Mrs. Slosson's collection. It is an easily recognizable species, very different from anything else known to me, though apparently similar to *B. magnifica* Strk. in type. It is not congeneric with *semicircularis* or *improvisa*, but I leave it with these for the present, as I do not know whether it does not agree with some of the European genera into which *Cymatophora* (*Bombycia* Grt.), has been divided. The body is slight, abdomen slender, considerably exceeding hind angles of secondaries. Head rather prominent, front bulging, protuberant, but not tuberculate; palpi short, weak, not reaching middle of front; antennæ of male lengthily bipectinated. Legs stout, tibiæ not spinose. Primaries large, frail in appearance, apices drawn out, outer margin oblique, rounded, without a distinct hind or anal angle.

Mr. Strecker says of his species that the secondaries are remarkably produced at outer angle, which is not the case here.

Will those who took part in the field meeting at Jamesburg please make a list of their captures on that occasion, and send to the editor. So many good species have been mentioned that it would be instructive to see how many species were taken by collectors who did not gather indiscriminately all that came to their view.

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## OBITUARY

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On Wednesday, Aug. 13, 1890, one of Albany's best known collectors of LEPIDOPTERA, Mr. Otto von Meske, died. Mr. Meske was born Feb. 5, 1837, near Kœnigsberg, Germany. Educated for a military career, in which his ancestors as well as his brothers have gained distinction, his artistic instincts were so strong that they induced him to throw up this life as soon as he could manage to do so and migrate to Paris, where, for two years, he studied with some of the leading portrait artists. At the age of twenty-one or twenty-two he came to New York, then to Albany, where he married and settled. His entomological interest began soon after his marriage, and increased to enthusiasm, when, with Dr. Bailey, Mr. Hill and Dr. Lintner, he made Albany and Center Station famous for the remarkable captures in Noctuidæ. Of this quartette Dr. Lintner alone remains. To Mr. Meske, Dr. Speyer owed most of the American material upon which his papers on our fauna are based. Some ten years since, the nervous disease, which finally resulted in death, made its first appearance, and necessitated a stop of active collecting. About five years ago his collection was sold to the U. S. National Museum, where it still remains and forms not the least valuable part of that grand collection of LEPIDOPTERA. Soon after, the disease made such progress as to gradually paralyze the lower extremities, and despite the best medical advice and treatment, Mr. Meske became utterly helpless so far as moving about was concerned, though retaining the use of arms and brain unimpaired to the last. About January, 1890, the end began approaching, and constant and continuous suffering slowly sapped a wonderful vitality, resulting in death at the date above given. Mr. Meske never published, but the frequent references in the writings of Grote, Speyer, Lintner, Harvey and Morrison, show that he did not conceal the facts observed by him. Mr. Meske leaves a wife and seven children surviving him. None of the children inherit their father's love for Entomology, though the interest of the family in Entomologists is kept up by the eldest daughter, who became Mrs. Editor not so many years ago.

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# ENTOMOLOGICA AMERICANA

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## PREPARATORY STAGES OF DATANA PALMII Beut.

BY HARRISON G. DYAR.

**EGG.**—Subspherical, flattened and slightly hollowed at the base. The top is centrally strongly depressed, this depression surrounded by a circular elevated ridge of considerable thickness. In the centre of the vertex is a circular punctiform depression, resembling a little hole. Color uniform sublustrous white. Diameter 1.1 mm.; height 8 mm.

Laid in masses of 75 or less on the underside of a leaf of the food-plant, usually near the top of the bush. The larva hatches by eating away the top of the egg, but leaves the sides untouched.

**FIRST STAGE.**—Head black and shining; width .5 mm. Body brown, with four lateral and three ventral dull yellowish stripes wider than the intervening spaces. Cervical shield, anal plate and feet, black. The hairs arise from minute blackish warts.

During this stage the larvæ eat only the parenchyma of the leaf and sit with the extremities of their bodies elevated like the other species of the genus.

**SECOND STAGE.**—Head higher than wide, flat in front, black (in a few examples brownish), smooth and shining. Width .9 mm. Furnished with a few pale hairs. Body reddish brown, the stripes yellowish. Cervical shield, anal plate and feet shining black. During this and subsequent stages the larvæ eat the whole leaf, remaining together upon one twig until it is defoliated.

**THIRD STAGE.**—Head black to blackish red in different examples; eyes and mouth black. Width 1.6 mm. Body dark reddish

brown, the stripes dull yellow, arranged as in the next stage, the subventral ones interrupted at the bases of the legs and correspondingly on the legless segments. Cervical shield, anal plate, thoracic and anal feet and the abdominal feet outwardly, black. A few short pale hairs.

**FOURTH STAGE.**—Head higher than wide, rounded, quite flat in front, depressed a little at the sutures at the top of the triangular plate and furnished with a few hairs. Color black, or blackish red to light mahogany-red, or even orange tinted in different examples of the same brood, the eyes and jaws black, labium and antennæ yellowish, the latter black ringed. Body black, becoming brownish, four lateral stripes, a subventral and ventral one pale yellow, the lateral ones becoming almost white in some examples, all nearly as wide as the intervening spaces. They run nearly to the anterior edge of joint 2, except the first and second lateral, which stop at the cervical shield and end before reaching the anal plate, except the third lateral and the ventral. The subventral line is interrupted by the light reddish bases of the legs and by reddish spots on the legless segments, except on joint 13. Cervical shield, anal plates, thoracic feet and the abdominal outwardly, shiny black; the anal plates punctured and narrowly bordered with ochre yellow. In some examples with red heads this border is broader, and the cervical shield is partly ochreous-orange. Hair whitish, thin and short, growing from minute black tubercles.

**FIFTH STAGE.**—Head as high as wide, rounded, a little flattened at the extreme front, depressed at the sutures at the top of the triangular plate and very minutely punctured. A few blackish hairs. Color light reddish orange, or with a brownish tinge not unlike the color of a cherry stone. Labium and antennæ paler, the latter with two black rings; jaws black; eyes blackish. Body black, the stripes pale yellow, the lateral ones in some examples becoming white and in a few canary-yellow, narrower than the intervening spaces, continuous from cervical shield and the anterior edge of joint 2, except the subventral, somewhat interrupted and irregular on joints 12 and 13, and barely reaching the anal plate, except the third lateral. Cervical shield, anal plate and abdominal feet, except an outward blackish band on the latter, concolorous with the head. Bases of all the legs (except the anal) and corresponding spots on the legless segments darker red. Thoracic and anal feet black. Hair thin, about 5 mm. long, with some short, more numerous, fine black hairs seen with a lens. At maturity the head is more of a brownish red. Length about 50 mm.

Pupation occurs in a subterraneous cell, and the Winter is passed in this state.

PUPA.—Similar in shape and color to those of the other species of *Datana* and not to be distinguished from them. The two cremasters are short, each with three spines, of which the middle one is usually shortest.

FOOD PLANT.—*Vaccinium stamineum*. Larvæ from Ulster County, N. Y.

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### Abstract of the Proceedings of the Entomological Club of the A. A. A. S.

The club met August 20th in the State House at Indianapolis, 26 persons attending the meetings. The President, Prof. A. J. Cook, delivered as his annual address an essay upon teaching Entomology, which was discussed by Messrs. Weed and Osborn.

Mr. Weed read a paper upon the life-history of the "evening primrose curculio (*Tyloderma foveolatum*)" and upon a Braconid parasite of the same. The paper was commented on by Mr. Webster.

Mr. Fletcher presented some notes upon the injuries caused by the Hessian Fly, the wheat-stem maggot and an undetermined species of *Oscinis*. The *Oscinis* was probably *variabilis* according to Dr. Williston.

This note produced extensive discussion by Messrs. Cook, Garman, Osborn, Atwood and Webster.

A paper on the subject of American Silk-spinners, by Mr. Edward L. Graef, was read by the Secretary. The author expresses his belief that some of the American *Saturniidae* might be made useful for the production of native silk, and offers a prize of \$50 for the best practical plans for accomplishing this purpose.

August 21st, Mr. Weed read a paper on the "Food-plants of the Clover Stem Borer (*Languria mozardi*);" he has found the larva feeding on fifteen species of plants. The paper was generally discussed.

Mr. Alwood announced his intention of studying tobacco insects, and mentioned having observed a stem borer. Mr. Weed had heard of a root louse in southern Ohio.

Mr. Osborn read a paper on a peculiar Coleopterous larva infesting the stems of plants.

Mr. Garman spoke of the asymmetry of the mouth-parts of the *Thysanoptera*.

Mr. Weed read a paper on the oviposition of *Listronotus latiusculus* on the stalks of *Sagittaria variabilis*, which was discussed by Messrs. Garman, Fletcher and Webster.

Mr. Robertson made some remarks upon the habits of *Emphor bombylifformis*, an apparently special visitor of *Hibiscus*. The subject elicited general discussion.

Miss Murtfeldt read a paper entitled, "Some experiences in rearing Insects." The paper was commented upon by Messrs. Fletcher, Webster and Osborn.

After general discussion it was "Resolved, that it is the sense of the Club that the meetings of the Association of Economic Entomologists and of the Entomological Club would both be benefitted by holding such meetings if possible, at the same time and place as the meeting of the American Association for the Advancement of Science."

The Secretary read a paper by Dr. Kellicott, of Columbus, O., upon "The preparatory stages of *Eustrotia caduca*," which was generally discussed.

Mr. Cook mentioned finding the eggs and rearing the larva of *Agrotis C-nigrum* on currant. Mr. Osborn read a paper on the period of incubation of Mallophaga. Mr. Earle presented some notes on injurious insects of southern Mississippi.

August 22d.—Mr. Weed presented a paper on the habits of *Lixus concavus*. Mr. Hargitt called attention to early observations on the canker worm, to a species of *Cecidomyia* infesting the tops of *Solidago*, and presented some "Notes upon *Cermatia forceps*." The latter was discussed by Messrs. Fletcher and Webster.

Officers were elected as follows: *President*, Herbert Osborn; *Vice-President*, Miss Mary E. Murtfeldt; *Secretary*, Clarence M. Weed.

Mr. Osborn presented a paper on "The uses of contagious diseases in destroying injurious insects," which was discussed by Messrs. Fletcher, Hargitt, Cook and Garman.

Mr. Atkinson spoke of a number of injurious Alabama insects, and of the species mentioned by him, *Thrips* and *Scolytus rugulosus* were further commented on by Messrs. Webster and Fletcher.

Mr. Weed read a paper on the oviposition of *Dectes spinosus* in *Ambrosia trifida*. Mr. Webster had usually found it about *A. artemisiaefolia*.

Mr. Cook presented some notes on the insects of the year, and Mr. Weed presented a paper on *Psephenus lecontei*, taken on the shores of Lake Erie.

SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.  
(Continued from p. 160, vol. vi.)

**LEPTURA** Serville.

The species of *Leptura* were arranged in synoptic form by Dr. LeConte in 1873. Since that time a few changes have been noted by Dr. Horn in various publications, and the result appears in the "Check List" of Mr. Henshaw. A few more remain to be noted as follows:

- cyarella** Lec. is undescribed, and = **chalybæa** Hald.
- zebra** Oliv. should be **nitens** Forst, on account of priority.
- quadrata** Lec. is a form of **instabilis** Hald.
- canadensis** Fab. should read **canadensis** Oliv.
- ebena** is a name proposed for a totally black form of **canadensis**.
- crassicornis** Lec. is the female of **crassipes** Lec.
- vittata** Germ. should read **vittata** Oliv.
- spuria** Lec. = **Acmæops militaris** Lec. *vide* Dr. Horn.
- vexatrix** Mann., formerly placed as a synonym of **sexmaculata** Linn., appears to be a distinct species.

For the last two corrections I am indebted to Dr. Horn as well as for many minor suggestions not specially acknowledged in the notes which follow the synopsis, and in preparing the lists of localities for the various species I have enjoyed the use of Dr. Horn's collection and the valuable assistance of Mr. Henshaw.

The following synopsis closely follows that of Dr. LeConte and incorporates all the changes that I have been able to discover. The descriptions of varieties in coloring are stated in the notes at the end.

**Synopsis.**

- A.—Prothorax more or less triangular, or campanulate, widest at the base, hind angles prolonged . . . . . **STENURA** Serv.
- B.—Prothorax more or less triangular, or campanulate, widest at the base, hind angles not prolonged; antennæ with 4½ joints punctured, the remainder sericeous . . . . . **LEPTURA** restrict. Serv.
- C.—Prothorax constricted before and behind (except in a); hind angles not prolonged; last joint of palpi dilated, triangular, truncate, sometimes obliquely, sometimes transversely, hind angles of head obtuse and rounded, never square; elytra scarcely narrowed behind . . . . . (**vittata**, etc.)
- D.—Prothorax constricted before and behind, hind angles scarcely prolonged, but broadly and feebly lobed; elytra parallel, truncate at tip, and armed with a strong sutural spine; not dilated, penultimate joint of maxillary nearly as long as last joint; hind angles of head short, rounded, genæ moderate, mouth rather short, front

with a deep transverse impression; antennæ slender, with  $4\frac{3}{4}$  joints punctured, remainder sericeous; 11th joint not appendiculate; ♂ with antennæ longer, and 5th ventral broadly and deeply emarginate with angles acute . . . . . (**valida** only)

E.—Prothorax quadrate, slightly narrowed in front, not constricted, but only feebly impressed behind, elytra feebly narrowed from the base, slightly truncate at tip; palpi as in B, with the last joint feebly dilated, truncate, and longer than the preceding; head suddenly narrowed behind, but not constricted, very short hind angles, rounded; antennæ with  $4\frac{1}{2}$  joints punctured, the remainder sericeous, 11th joint ♂ very strongly appendiculate, 7th and following with a smooth, feebly carinated line beneath.

(**mutabilis**, etc.)

F.—Prothorax constricted before and behind, wider at base, hind angles not prolonged; elytra wider, parallel, rounded at tip; head suddenly narrowed far behind the eyes, but not constricted; hind angles, therefore, long, broadly rounded; *eyes* not emarginate; antennæ inserted a little behind the front margin of the eyes, slender, with  $4\frac{1}{2}$  joints punctured, remainder sericeous, 11th joint simple; genæ rather short, palpi with the last joint triangular, truncate, as in *vittata*. This group differs from *Acmæops*, chiefly by the position of the antennæ . . . . . (**cutibialis** only)

A a.—Prothorax strongly narrowed from the base, which is broadly but deeply bisinuate, posterior transverse impression distinct; elytra widest at the base, gradually narrowed behind, truncate and emarginate at tip which is not margined . (**emarginata** to **rubida**)

A b.—Prothorax nearly smooth, strongly and gradually narrowed from the base, which is bisinuate, hind impression very deep; elytra very coarsely punctured, not narrowed, very dehiscent, rounded, subacuminate and distinctly margined at tip . (**cruentata** only)

A c.—Prothorax punctured, without hind impression, campanulate, but subquadrate, hind angles small (except *americana*); elytra parallel, genæ very short . . . . . (**chalybæa**, **hæmatites**, etc.)

A d.—Prothorax transversely depressed at the base, convex, much rounded on the sides before the middle, hind angle small (except in *impura*); elytra at base wider than prothorax, more or less narrowed behind, usually black, spotted or banded with yellow; genæ moderately long (shorter in last two) . . (**læta**, **cordifera**, etc.)

A e.—Prothorax longer than wide, subcampanulate, with a deep transverse impression near the base, hind angles broad, laminate; color black, elytra sometimes testaceous, scarcely narrowed behind; antennæ with 4th joint very short . . . . . (**brevicornis**, etc.)

A a.

Antennæ feebly serrate; 5th ventral ♂ flattened, broadly truncate-emarginate and bidentate; mouth short, hind angles of head more prominent.

Black, velvety pubescent; elytra red, with apex black.

Elytra not sulcate, prothorax sparsely punctured . . . . . **emarginata**.

Elytra sulcate; prothorax densely punctured . . . . . **gigas**.

Antennæ filiform; 5th ventral ♂ broadly truncate-emarginate and bidentate; mouth long, hind angles of head less prominent.

Prothorax densely not finely punctured.

Elytra yellow, with anterior blotch (frequently wanting), medial band and apex black; legs varied black and yellow; sides and base of prothorax sometimes yellow; antennæ usually annulated.

Antennæ long and slender . . . . . **obliterata.**

Antennæ stouter; elytra with middle and posterior band black. **soror.**

Elytra yellow, more obliquely truncate at tip, lateral spot near the middle, suture behind and apex black; legs, antennæ and body black . . . . . **propinqua.**

Elytra yellow, with vague medial and posterior bands interrupted at the suture, sides of prothorax, abdomen and legs testaceous; tarsi, tip of posterior tibiæ and hind femora fuscous; narrower than *obliterata*, with the ♂ antennæ longer and 11th joint very distinctly appendiculate, and prothorax more sinuate on the sides.

**deleta.**

Prothorax more finely punctured.

Black, elytra luteo-testaceous or black, tip blackish; 3d, 4th and base of 5th ventral segments red . . . . . **plebeja.**

More slender, antennæ annulate with yellow; ♂ black, base of legs yellow; elytra with base of epipleuræ yellow and a broad vitta; ♀ testaceous, disc of thorax, scutellum, suture, side margin, transverse spot at middle and tip of elytra black; legs varied with black . . . . . **subhamata.**

Prothorax strongly less densely punctured.

Much broader and stouter, hind impression of prothorax very deep; abdomen red, base and tip blackish; ♂ black; ♀ yellow, occiput, two prothoracic spots, knees, tips of tibiæ and tarsi black; elytra black, with side margin and oblique vitta yellow; varies with trunk fuscous, and prothorax with the disc black . **abdominalis.**

Broad, black, prothorax deeply impressed behind, elytra ♀ sanguineous, with a very broad, common, discoidal stripe not reaching the base; abdomen sanguineous; ♂ black . . . . . **plagifera.**

Smaller, black, prothorax less deeply impressed; elytra with a spot near the tip yellow . . . . . **amabilis.**

Prothorax densely punctured, feebly impressed; form slender.

Prothorax not sinuate on the sides, fuscous, finely pubescent; elytra testaceous; suture; dorsal vitta and submarginal spots blackish; legs testaceous, antennæ annulate . . . . . **lineola.**

Black, clothed with short yellow pubescence, elytra dark testaceous, coarsely punctured, tip sometimes black . . . . . **rubida.**

A b.

Black, sides of elytra, metathorax and abdomen red; thighs red, with the tip black . . . . . **cruentata.**

A c.

Elytra rounded and margined at tip.

Black; elytra blue, polished, coarsely and sparsely punctured, antennæ and legs either black or yellow . . . . . **chalybæa.**

Black; head and prothorax light rufous.

Elytra shining, very coarsely punctured, tip subtruncate; prothorax without impressions . . . . . **capitata.**

Elytra densely, not coarsely punctured, tip rounded; prothorax impressed near the hind angles . . . . . **americana.**

Black, hoary with fine white pubescence, prothorax dull red . **hæmatites.**

Black, with white pubescence; head, prothorax, legs and scape of antennæ more or less yellow . . . . . **exigua.**

Elytra scarcely or not margined at tip.

Dull black, hoary with fine white pubescence; head, legs and scape of antennæ sometimes ferruginous, or partly so . . . . **subargentina.**

Dark blue, elytra with red humeral spot, sometimes wanting . **molybdica.**

A d.

Prothorax transversely excavated along the whole base, sides sinuate, tip strongly tubular; body beneath, margins of prothorax and elytral bands golden pubescent; tip truncate, legs ferruginous.

Yellow bands broader at the suture.

Antennæ very stout, dark ferruginous . . . . . **læta.**

Antennæ more slender, nearly black (*zebra*) . . . . . **nitens.**

Bands equal, straight . . . . . **tribalteata.**

Prothorax feebly excavated each side near the hind angles; pubescence not golden.

Brownish yellow, densely clothed with fine pubescence, hind angles of prothorax more explanate and prolonged; elytra with a faint lateral fuscous spot at the middle; tip truncate . . . . . **impura.**

Prothorax narrowed from the base, sides subsinuate; elytra yellow, with two marginal spots and tip black, the latter dehiscent, not truncate; often has in addition a black common spot on the suture, sometimes narrowly connected with black tip . . . **cordifera.**

Prothorax not narrowed from the base, sides sinuate, rounded in front; elytra with yellow bands or spots, variously confluent, sometimes entirely black, suture dehiscent, tip rounded . **instabilis.**

Prothorax not wider than long, more finely and densely punctured, body less robust; elytra less dehiscent at tip, which is more broadly rounded and scarcely margined; yellow, with base, two bands and apex black, bands sometimes interrupted . **sexmaculata.**

Prothorax more rounded in front; elytra depressed on disc, truncate and emarginate at tip; yellow, with two blotches, humeral and medial, and tip black . . . . . **vexatrix.**

Legs and antennæ ferruginous; elytra feebly dehiscent, tips broader and nearly rounded, distinctly margined; elytra yellow, entire margin black, a discoidal spot near the base, large lateral one near the middle, and transverse one near tip black. **sexspilota.**

Prothorax broader than long, campanulate, transversely excavated or de-

pressed along the whole base, sinuate on the sides, tip strongly constricted and tubular; pubescence not golden; elytra rounded and margined at tip; mouth and genæ rather stout.

Elytra testaceous, with a large blotch behind the middle, extending to the margin, but not the suture, and tip black; markings sometimes faint . . . . . **matthewsii.**

Entirely black, more coarsely punctured . . . . . **grossa.**

A e.

Prothorax coarsely; elytra very coarsely punctured, truncate and spinose; antennæ ♀ short, thickened externally . . . . . **brevicornis.**

Prothorax densely and coarsely punctured; antennæ slender; elytra sharply truncate at tip . . . . . **nigrella.**

Prothorax sparsely punctured; antennæ slender; elytra feebly truncate at tip. **carbonata.**

B.

B a.—Antennæ annulated with yellow, 11th joint distinctly divided; elytra narrowed from the base, tip truncate and dentate; ♂ antennæ serrate, and 5th ventral flattened triangularly, emarginate and bidentate . . . . . (**canadensis** to **circumdata**)

B b.—Antennæ annulated or nearly black, subserrate in ♂; with the 11th joint feebly appendiculate; elytra narrowed from the base, very dehiscent at tip, which is nearly rounded and indistinctly margined; form short and very stout . . . (**vagus** and **dehiscens**)

B c.—Antennæ not annulated, 11th joint scarcely appendiculate; elytra slightly narrowed from the base, sharply truncate at tip; prothorax scarcely constricted behind . . . (**sanguinea** to **dolorosa**)

B d.—Antennæ not annulated, 11th joint scarcely appendiculate; elytra slightly narrowed from the base ♂, almost parallel ♀, elevated at the base, elongate, scarcely truncate, not densely, but very finely pubescent; yellow with black spots or bands; prothorax bell shaped, transversely depressed at base, which is more deeply sinuate than usual . . . . . (**crassipes** to **octonotata**)

B c.—Antennæ annulated, 11th joint not appendiculate; elytra parallel, elongate, not elevated at base, truncate at tip; prothorax bell shaped, constricted strongly at tip, and less strongly at base; hind angles of head obtuse, genæ moderate, front with a transverse impression . . . . . (**pedalis**)

B a.

Elytra ♂ and ♀ truncate-emarginate at tip; prothorax more deeply constricted behind; antennæ strongly appendiculate, ♂ strongly serrate almost entirely black, ♀ feebly serrate, joints 4-11 annulate with yellow; black, elytra more or less red. **canadensis.**

Elytra truncate at tip, ♂ sometimes feebly emarginate; prothorax feebly constricted behind.

Elytra entirely red; antennæ ♂ and ♀ with joints 1-5 black, 11th joint feebly appendiculate; ♂ antennæ serrate, abdomen red, ♀ antennæ nearly filiform, abdomen black . . . . . **rubrica.**

Elytra pale, side margin and tip black; small species . . . . . **circumdata.**

B b.

- Antennal joints 6-11 annulate with yellow; elytra very coarsely punctured, more or less testaceous or red, sometimes entirely black; ♂ with 5th ventral deeply excavated and emarginate . . . **vagans.**  
Antennæ entirely black; elytra less coarsely punctured, testaceous; ♀ with 5th ventral less excavated and emarginate . . . . . **dehiscens.**

B c.

- Prothorax densely and coarsely punctured; 5th ventral ♂ flattened and truncate.  
Elytra reddish, testaceous, fuscous towards tip, which is transversely truncate . . . . . **sanguinea.**  
Elytra obliquely truncate; ♂ entirely black, or partly testaceous, ♀ elytra scarlet, with a subsutural spot before the middle, one near the side at the middle, and the tip black . . . . . **lætifica.**  
Elytra testaceous, feebly truncate, apex and subapical band black; pubescence very long . . . . . **hirtella.**  
Prothorax less densely punctured; 5th ventral ♂ flattened and broadly rounded.  
Elytra obliquely truncate and subdentate at tip; black, with yellow markings, viz.: a subscutellar spot and two transverse bands, connected at the suture, more or less interrupted, and even reduced to two smaller spots . . . . . **quadrillum.**  
Prothorax coarsely punctured; elytra densely pubescent with golden hair arranged transversely; 5th ventral ♂ scarcely impressed; elytra transversely truncate, frequently fuscous at the sides. **chrysocoma.**  
Prothorax usually densely and coarsely punctured, transversely impressed and constricted behind, disc more or less channeled; 5th ventral ♂ scarcely impressed; pubescence of the elytra short and sparse.  
First joint of middle tarsi as long as the two following; prothorax feebly impressed.  
Pubescence of prothorax golden; elytra testaceous, suture and lateral vitta extending to tip black . . . . . **nigrolineata.**  
Black, pubescence brown; elytra and legs testaceous, prothorax subangulated on the sides, elytra more coarsely punctured . . . **rufula.**  
First joint of middle tarsi scarcely longer than the second; sides of elytra more sinuate.  
Elytra testaceous, tip black, or entirely black . . . . . **proxima.**  
First joint of the middle tarsi as long as the two following; prothorax sparsely punctured, more deeply channeled and impressed; hind angles of head more tumid and nearly square; elytra elevated at base.  
Fusco-testaceous, elytra paler, with a medial marginal dark spot; antennæ ♂ very long . . . . . **biforis.**  
Black, antennæ ♂ moderate . . . . . **dolorosa.**

B d.

Hind angles of head square, genæ rather long; ♂ with 5th ventral impressed, truncate and emarginate.

Prothorax obtusely angulated or strongly sinuate on the sides; legs entirely yellow; ♂ elytra yellow, apex black (sometimes enclosing yellow spot) and two incomplete bands black; antennæ more slender, fuscous or black; ♀ elytra yellow, with apex and three bands (sometimes incomplete) black; antennæ very stout, yellow.

**crassipes.**

Prothorax rather rounded than sinuate on the sides; thighs and tips of tibiæ dark; abdomen black . . . . . **tibialis.**

Hind angles short, tumid, but obtuse, neck less constricted; prothorax less sinuate on the sides, more finely and less densely punctured; pubescence white, long and fine.

Black, elytra with a basal spot, two bands connected near the suture, and a large spot near the tip yellow; legs and abdomen ferruginous, tarsi dusky . . . . . **behrensii.**

Hind angles of head very short, rounded; ♂ as above.

Blackish blue, shining, prothorax feebly rounded on the sides; elytra slightly truncate at tip, with four pale yellow spots on each; base of thighs pale . . . . . **octonotata.**

B e.

Black, with fine, sparse, yellowish pubescence; head and prothorax finely, very densely punctured; elytra twice as wide as prothorax, punctured, more densely and a little more finely towards the tip; antennæ long and slender, annulate with pale, legs ferruginous or fuscous . . . . . **pedalis.**

C.

C a.—Elytra protuberant at base; tip subtruncate, suture with a small spine; prothorax scarcely constricted, more deeply bisinuate at base.

C b.—Elytra not protuberant at base, rounded at tip; prothorax very deeply constricted before and behind, sides strongly rounded and disc very convex; head prolonged behind eyes.

C c.—Elytra not protuberant at base, rounded at tip; prothorax slightly constricted at base and at tip, sides tuberculate; head prolonged behind the eyes; antennæ stout, third and fourth joints united, equal to fifth.

C a.

Head prolonged behind the eyes; sparsely punctured, black, shining; elytra with a yellow vitta, sometimes wanting, or entirely testaceous.

**vittata.**

Neck very near to the eyes; black, prothorax pubescent, with erect hair, densely punctured with a smooth dorsal vitta . . . **pubera.**

C b.

Black, front legs, base of thighs and tibiæ, more or less yellow; prothorax

- sometimes red (*ruficollis* Say), very finely pubescent, nearly smooth; base punctured . . . . . **sphaericollis.**
- Black, front legs, base of thighs and tibiae, more or less yellow; prothorax sparsely, finely punctured, base punctured; elytra more coarsely punctured, with a yellow vitta extending from base almost to tip, sometimes interrupted near the tip . . . . . **vibex.**
- Testaceous, prothorax densely punctured, clothed with yellow pubescence; elytra more coarsely punctured, with a sutural and lateral black vitta, extending nearly to the tip . . . . . **aurata.**
- Piceous or black, prothorax scarcely punctured, feebly pubescent; elytra less coarsely punctured, with three marginal spots and a sinuate black vitta extending from base for three-fourths the length, where it is confluent with the posterior spot, or vitta reduced to a very short basal streak and marginal spots to faint clouds; legs testaceous, hind thighs dusky at tip . . . . . **scripta.**

C c.

- Testaceous, elytra very coarsely punctured, with a small fuscous spot near the side about the middle . . . . . **gnathoides.**

D.

- Testaceous, finely pubescent; elytra with narrow sutural line, two small clouds near the base, and two about the middle fuscous (very large species) . . . . . **valida.**

E.

Elytra punctured.

- Black, prothorax slightly, but distinctly narrowed in front, pubescence short; elytra black or testaceous . . . . . **mutabilis.**
- Black, prothorax nearly square, pubescence long, erect, fuzzy (one specimen only known) . . . . . **quadricollis.**

Elytra rough, with elevated points or granules.

- Very black, thorax feebly bisinuate on the sides; antennæ not carinated, 11th joint not appendiculate . . . . . **aspera.**

F.

- Black, antennæ brown, front legs ferruginous, with knees, tip of tibiae and tarsi dark; head and prothorax longer than wide, densely and finely punctured, the latter subcanaliculate, with smooth, narrow, dorsal space (looks like *Acmaeops*) . . . . . **cubitalis.**

Bibliography and Notes.

**L. emarginata** Fab., 1775, Ent. Syst. i, 2, p. 341; Oliv., Ent. iv, 73, p. 5, t. 3, fig. 26; Hald., Trans. Am. Phil. x, p. 62.  
 Length 30 mm. = 1.20 inch. *Hab.*—Pa., N. C., N. Y., Texas.

**L. gigas** Lec., 1873, S. M. C. No. 264, p. 223.  
 Length 30—35 mm. = 1.20—1.40 inch. *Hab.*—Texas, N. Mex.

These two are easily known by the large size and red elytra, sulcate in *gigas*, not in *emarginata*.

**L. obliterata** Hald., 1847, l. c.; *perductor* Walker, Nat. Hist. Vanc. 1866, ii, p. 333; *vittiosa* Lec., Proc. Ac. Phil. vii, 1854, p. 18; Ent. Rep. 1857, p. 64.

Length 15—18 mm. = .60—.72 inch. *Hab.*—Vanc., Wash., Oreg., Cal., Nev., Mont., Id.

Varies in the extent of the black markings, and LeConte's name *vittiosa* is applied by some to the specimens with elytral tip black, reserving *obliterata* for the lighter specimens without black tip.

**L. soror** Lec., 1873, S. M. C. No. 264, p. 223.

Length 12 mm. = .48 inch. *Hab.*—Cal., Vanc.

Very close to the preceding, but the elytra lack the ante-medial spot and the antennæ are stouter, the fourth joint more distinctly shorter than the fifth than in *obliterata*.

**L. propinqua** Bland, 1865, Proc. Ent. Soc. Phil. p. 384.

Length 12—16 mm. = .48—.64 inch. *Hab.*—Col., Nev., N. Mex., Ariz., Or., Wash., Id., Mont., Can. W.

**L. deleta** Lec.; 1853, J. A. P. ser. 2, ii, p. 328.

Length 12 mm. = .48 inch. *Hab.*—Mass.

**L. plebeja** Rand., 1838, Bost. Jour. ii, p. 28; Lec., l. c. p. 333.

Length 13 mm. = .52 inch. *Hab.*—Can., Mich., N. J., N. C., N. H., L. Superior, Maine.

These seem to be rare in collections, and I have been unable to procure specimens of *deleta* and *plebeja*. The descriptions in table will serve to identify them. The general form is similar to the neighboring species.

**L. subhamata** Rand., 1838, Bost. Journ. ii, p. 28; Hald., l. c. p. 61; *armata* Hald., l. c. p. 61; *interrupta* Newn., Ent. 1841, p. 72; *lecontei* Dej. Cat.; *elegans* Lec., l. c. p. 329; Hald., l. c. p. 63.

Length 12—15 mm. = .48—.60 inch. *Hab.*—Can., N. H., Mich., N. J., N. Y., Pa., Va., N. C., Ill., Mass.

An abundant and variable species, ♂ and ♀ differing in color, the ♀ being much the blacker. The normal marking of thorax is black with yellow sides ♀, yellow preponderating ♂, or reducing the black color to a discal line in the form *elegans* Lec. The elytra are normally black with a yellow vitta interrupted at middle and not reaching tip ♀, or yellow color exceeding black ♂, or reducing the black to a short, transverse, medial spot, form *elegans* Lec. The black color also disappears almost entirely from the legs in this extreme form.

**L. abdominalis** Hald., 1847, l. c. p. 63, ♂; *atrovittata* Bland, 1864, Proc. Ent. Soc. p. 255 ♀.

Length 15 mm. = .60 inch. *Hab.*—N. J., Ga., So. La., Texas.

A conspicuously stout species, the sexes differing in color and described under different names.

**L. plagifera** Lec., 1873, S. M. C. No. 264, p. 224 ♀. *anthracina* Lec., 1875, Trans. Am. Ent. Soc. v, p. 174 ♂.

Length 13 mm. = .52 inch. *Hab.*—Nev., Col., Cal., Mont. Id., Or.

**L. amabilis** Lec., 1857, Ent. Rep. p. 64.

Length 7.5 mm. = .30 inch. *Hab.*—Or., Wash.

This species seems to be rare, and is in few collections.

**L. lineola** Say, 1823, J. A. P. iii, p. 421; Lec., J. A. P. ser. 2, i, p. 330; Dej. Cat. 3 ed. p. 362; *indirecta* Newn. Ent. 1841, p. 71; *cincta* Hald. Trans. Am. Phil. x, p. 63.

Length 8—13 mm. = 32—52 inch. *Hab.*—N. Y., Pa., Va., Texas, Md., Can., N. H., Mass., N. C., Miss., C. W.

**L. rubida** Lec., 1873, S. M. C. No. 264, p. 224.

Length 13 mm. = .52 inch. *Hab.*—Cal.

This species also seems rare. Dr. LeConte's description says "general form is the same as *subargentata*."

**L. cruentata** Hald., 1847, l. c. p. 64.

Length 9 mm. = .36 inch. *Hab.*—Pa., Ga., Texas, Can. W.

**L. chalybæa** Hald., 1847, l. c. p. 60; Lec., J. A. P. ser. 2, i, p. 331; *cyanella* Lec. (undescribed)

Length 6 mm.; .24 inch. *Hab.*—Can., N. Y., Pa., N. C., O., Ia.

**L. capitata** Newn., Ent. 1841, p. 71; Hald., l. c. p. 65; *sanguinicollis* Dej. Cat.

Length 6.5—9 mm.; .26—.36 inch. *Hab.*—Can., N. H., Pa., Mich., Ia., Ohio, Ga., N. Y., Mo., Mass.

**L. americana** Hald., 1847, l. c. p. 63; Lec., J. A. P. ser. 2, i, p. 331; *fuscicollis* Dej. Cat.

Length 8—9 mm.; .32—.36 inch. *Hab.*—Ohio, Ind. T., Ga., Pa.

The hind angles of prothorax are very prominent in this species, which otherwise greatly resembles the preceding.

**L. hæmatites** Newn., Ent. 1841, p. 73.

Length 4—6 mm.; .16—.24 inch. *Hab.*—Mass., Ct., N. Y., N. C., N. Ill.

Very abundant near New York on the blossoms of *Cornus*.

**L. exigua** Newn., 1841, Ent. p. 73; *nana* Newn. l. c.; *saucia* Lec., Proc. Ac. Phil. 1862, p. 40.

Length 5.5—7 mm.; .22—.28 inch. *Hab.*—Can., Mass., N. Y., Pa., N. Ill.

The species is found to vary considerably in color. See note by Dr. Horn, vol. i, p. 8. "The typical form is black, the basal

joint of antennæ and front legs pale; *nana* has mouth, front legs, and bases of middle and hind femora pale; *saucia* has legs similar to *nana*, the thorax yellow, with a large discoidal black spot; sometimes the angles only yellow."

**L. subargentata** Kirby, 1837, Fn. Bor. Am. iv, p. 184; Mann., Bull. Mosc. 1853, iii, p. 251; *ruficeps* Lec., Proc. Ac. Phil. 1862, p. 40; *similis* Ky., l. c., p. 185; Lec., J. A. P. ser. 2, p. 331; *rufibasis* Lec., Proc. Ac. Phil. 1862, p. 40; *rhodopus* Lec., Trans. Am. Ent. Soc. 1874, p. 68.

Length 6—7.5 mm.; .24—.30 inch. *Hab.*—Alaska, Vanc., H. B. T., L. Sup., N. H., N. Y., Ga., Mich., Col., N. Mex., Nev., Cal., Wash., Can. W., Can. E., Mont., Mass.

This is another very variable species in color. The typical form is entirely black, hoary with fine white pubescence.

Form *ruficeps*: head dull ferruginous; front legs and base of middle thighs testaceous.

Form *similis*: scape, front legs, base of middle and part of hind tibiæ ferruginous.

Form *rufibasis*: scape and legs ferruginous.

Form *rhodopus*: entirely black.

**L. molybdica** Lec., 1850, J. A. P. ser. 2, i, p. 101; *militaris* Chev., Rev. Zool. 1855, p. 187; Ann. Fr. 1858, p. 529, t. 12, fig. 3.

Length 5—6 mm.; .20—.24 inch. *Hab.*—Cal., Rocky Mts., Nev., Or.

Chevrolat's name *militaris* is usually applied to the form with red humeral angles.

**L. læta** Lec., 1857, Ent. Rep. p. 64.

Length 12.5 mm.; .50 inch. *Hab.*—Wash., Or., Cal., Nev., Vanc.

**L. nitens** Forst., 1771, Nov. Spec. Ins. p. 45; *zebra* Oliv., 1795, Ent. iv, 73, p. 19, t. 3, fig. 33; Hald., 1849, Trans. Am. Phil. x, p. 62; *carolina* Web., 1801, Obs. Ent. 1, p. 91; *quagga* Germ., 1824, Ins. Lep. nov. p. 521.

Length 10—13 mm.; .40—.52 inch. *Hab.*—Massachusetts, New York, Pennsylvania, North Carolina, Illinois, Texas, New Jersey, Iowa, Georgia, Canada West.

Forster's name has priority, and should be restored. The confusion caused by the strong resemblance to *Typocerus zebratus* is noted in the remarks under that species, and it is well to have the names more distinctive.

**L. tribalteata** Lec., 1873, S. M. C. No. 264, p. 224.

Length 7—10 mm.; .28—.40 inch. *Hab.*—Névada, California, Idaho.

**L. impura** Lec., 1857, Ent. Rep. p. 64.

Length 9 mm.; .36 inch. *Hab.*—Nevada, Oregon, California.

**L. cordifera** Oliv., 1795, Ent. iv, p. 25, t. 4, fig. 41; Lec., J. A. P. ser. 2, i, p. 332; *abdominalis* Dej. Cat. 3 ed.; *rosarum* Lec., l. c.; *lunaris* Hald., Trans. Am. Phil. x, p. 59.

Length 10—13 mm.; .40—.52 inch. *Hab.*—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Virginia, North Carolina, Georgia, Michigan, Maryland, Lake Superior.

**L. instabilis** Hald., 1847, Trans. Am. Phil. x, p. 59; Lec., J. A. P. ser. 2, i, p. 332; *convexa* Lec., l. c.; *quadrata* Lec., S. M. C. No. 264, p. 225.

Length 7—13 mm.; .28—.52 inch. *Hab.*—New Hampshire, Montana, Idaho, Wyoming, Oregon, Washington, California, Nevada, Colorado, Kansas, New Mexico, Saskatchewan.

This species and the preceding are continually confused in collections; the differences and variations in color are pointed out in the synoptic table. It will be noted that *cordifera* is an eastern species, and *instabilis* a western, though the localities overlap somewhat. The specimens in collections are usually banded and labeled *convexa*, and the name *instabilis* retained for those with the bands broken into spots. I propose to extend the name *quadrata* Lec. to the form which is entirely black, it having been originally applied to a specimen nearly black, with antennæ and legs ferruginous.

**L. sexmaculata** Linn., Syst. Nat. ed. x, p. 398; Oliv., Ent. iv, 73, p. 26; Kby., 1837, Fn. Bor. Am. iv, p. 182.

Length 9.5 mm.; .38 inch. *Hab.*—Colorado, Michigan, New Hampshire, Vancouver, Lake Superior, Canada.

This insect is common to our northern latitudes and those of Europe.

**L. vexatrix** Mann., 1853, Bull. Mosc. iii, p. 250.

Length 10.5 mm.; .42 inch. *Hab.*—Kenai, California, Nevada, Oregon.

This species has been confused with the preceding form, which it differs by the characters of the table.

**L. sexspilota** Lec., 1859, Proc. Ac. Phil. p. 80.

Length 9 mm.; .36 inch. *Hab.*—California.

**L. matthewsii** Lec., 1869, Ann. Nat. Hist. iv, p. 384.

Length 14 mm.; .56 inch. *Hab.*—Vancouver, Washington, California.

**L. grossa** Lec., 1875, S. M. C. No. 264, p. 225.

Length 18 mm.; .72 inch. *Hab.*—California.

**L. brevicornis** Lec., l. c.

Length 18—19 mm.; .62—.76 inch. *Hab.*—Washington, Nevada.

**L. nigrella** Say, 1827, J. A. P. v, 2, p. 279; *nigrita* Dej. Cat. 3 ed.

Length 10—15 mm.; .40—.60 inch. *Hab.*—Hudson's Bay, Michigan, Washington, Nevada, Colorado, New Mexico, Canada, Lake Superior, Georgia, Maine.

- L. carbonata** Lec., 1861, Proc. Ac. Phil. p. 355.  
Length 9.5 mm.; .38 inch. *Hab.*—Washington, California.
- L. canadensis** Oliv., 1795, Ent. iv, 73, p. 8, t. 3, fig. 27; Fab., 1801, Syst. El. ii, p. 357; Kirby, Fn. Bor. Am. iv, p. 181; *tenuicornis* ♂ Hald., Trans. Am. Phil. x, p. 64; *erythroptera* Kirby; l. c. p. 180; *cinamoptera* Hald., l. c. p. 64; *cribripennis* Lec., Col., Kansas, 1859, p. 21.  
Length 12—18 mm.; .48—.76 inch. *Hab.*—Canada, Nova Scotia, New Hampshire, Michigan, New York, Pennsylvania, Virginia, Kansas, Colorado, Idaho, Vancouver, Massachusetts, Louisiana, Missouri, Canada West, Georgia, Lake Superior, New Mexico, Nebraska, Oregon.
- Olivier's description antedates that of Fabricius. The specimens vary a great deal in color and in punctuation. The name *cribripennis* Lec. is applied to very coarsely punctate, shining specimens; *erythroptera* Ky., to specimens with entirely red elytra, not shining; *canadensis* Oliv., to specimens with elytra bicolored, not shining; *ebena* is proposed for specimens with elytra entirely black.
- L. rubrica** Say, 1823, J. A. P. iii, p. 418; Hald., Proc. Ac. Phil. iv, p. 374; *annulata* Dej. Cat. 3, ed.; *erythroptera* Germ., Spec. Ins. nov. p. 522; Hald., Trans. Am. Phil. x, p. 64.  
Length 10—16 mm.; .40—.64 inch. *Hab.*—Massachusetts, New York, New Jersey, Virginia, Georgia, N. Illinois, Michigan, Nebraska, Pennsylvania, Colorado, Kansas.
- L. circumdata** Oliv., 1795, Ent. 73, p. 32, t. 4, fig. 48; Hald., l. c. p. 65.  
Length 7—8 mm.; .28—.32 inch. *Hab.*—Massachusetts, New York, Pennsylvania.
- L. vagans** Oliv., 1795, l. c. p. 31; Lec., J. A. P. ser. 2, i, p. 337; *axillaris* Dej. Cat. 3 ed.; *brevis* Kby., Fn. Bor. Am. iv, p. 182.  
Length 9—12 mm.; .36—.48 inch. *Hab.*—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Virginia, North Carolina, Georgia, Michigan, Maine, Canada, Canada West.
- L. dehiscens** Lec., Proc. Ac. Phil. 1859, p. 89.  
Length 10—11.5 mm.; .40—.46 inch. *Hab.*—Washington, California, Oregon, Vancouver.
- L. sanguinea** Lec., l. c.  
Length 10 mm.; .40 inch. *Hab.*—Vancouver, Washington, California, Colorado, N. Mexico, Nevada, Michigan, N. Hampshire, Oregon.
- L. lætifica** Lec., l. c.; *lugens* Lec., l. c.  
Length 8—12 mm.; .32—.48 inch. *Hab.*—Nevada, Washington, California, Oregon.
- L. hirtella** Lec., 1873, S. M. C. No. 264, p. 226.  
Length 10 mm., .40 inch. *Hab.*—Labrador, New Hampshire.

- L. quadrillum** Lec., Proc. Ac. Phil. 1859, p. 88.  
Length 9—10 mm.; .36—.40 inch. *Hab.*—Vancouver, Washington, California, Oregon.
- L. chrysocoma** Kby., 1837, Fn., Bor. Am. iv, p. 179, t. 5, fig. 2; *auripilis* Lec., J. A. P. ser. 2, i, p. 339.  
Length 12—14 mm.; .48—.56 inch. *Hab.*—Hudson's Bay, Canada, Nova Scotia, Michigan, Idaho, Vancouver, Colorado, Maine, Lake Superior, Utah, New York, Oregon, California, Nevada, N. Mexico.
- L. nigrolineata** Bland, 1865, Proc. Ent. Soc. Phil. iv, p. 383.  
Length 7 lines; 14.5 mm.; .58 inch. *Hab.*—Colorado, Idaho.
- L. rufula** Hald., 1847, Trans. Am. Phil. x, p. 60.  
Length 9.25 mm.; .37 inch. *Hab.*—Michigan, Lake Superior.
- L. proxima** Say, 1823, J. A. P. iii, p. 420; Hald., Trans. Am. Phil. x, p. 65; *subpubescens* Kby., Fn. Bor. Am. iv, p. 180; *terminata* Dej. Cat. 3 ed.; *atrata* Lec., J. A. P. ser. 2, i, p. 339; Dej. Cat. 3 ed.  
Length 14 mm.; .56 inch. *Hab.*—Canada, New Hampshire, New York, Virginia, Georgia, Ohio, Michigan, Missouri, Illinois, Wisconsin, Massachusetts, Canada West, Pennsylvania.  
The name *atrata* Lec. was applied to specimens entirely black.
- L. biforis** Newn., 1841, Ent. p. 70; Hald., Trans. Am. Phil. x, p. 64.  
Length 12—13 mm.; .48—.52 inch. *Hab.*—Canada, Pennsylvania, Virginia, New York, Canada West.  
This species resembles the entirely testaceous form of *L. vittata*, and thereby becomes mixed with it in collections.
- L. dolorosa** Lec., Proc. Ac. Phil. 1861, p. 355.  
Length 13 mm.; .52 inch. *Hab.*—Vancouver, Washington, California, Nevada, Oregon.
- L. crassipes** Lec., Ent. Rep. 1857, p. 65; *crassicornis* ♀ Lec., S. M. C. No. 264, p. 227.  
Length 10—13 mm.; .40—.52 inch. *Hab.*—Vancouver, Washington, Oregon, California, Nevada, Idaho.  
A large series collected by Mr. H. F. Wickham in Idaho appeared to me to correspond with Dr. LeConte's description of *crassicornis* previously known by one specimen in Mr. Ulke's cabinet. Dr. Horn confirmed this opinion, but found the specimens to be all females, while the specimens of *crassipes* corresponding to the description were all males, whereby the synonymy above was established.
- L. tibialis** Lec., 1850, Agass. Lake Superior, p. 236.  
Length 10—13 mm.; .40—.52 inch. *Hab.*—Lake Superior, Michigan, Washington, New Hampshire.
- L. behrensii** Lec., 1873, S. M. C. No. 264, p. 227.  
Length 17 mm.; .68 inch. *Hab.*—California.  
These two seem to be rather rare.

**L. octonotata** Say, J. A. P. iii, p. 419; Hald., l. c. p. 65; *stictica* Newn., Ent. p. 72; *4-punctata*, Hald., l. c. p. 64.

Length 10–20 mm.; .40–.48 inch. *Hab.*—Massachusetts, Pennsylvania, Virginia, Alabama, Mississippi, N. Illinois, New York, Wisconsin, Canada West.

**L. pedalis** Lec., Proc. Ac. Phil. 1861, p. 355.

Length 10 mm.; .40 inch. *Hab.*—New Hampshire, Lake Superior, Michigan, Anticosti.

**L. vittata** Oliv., Ency. Méth. vii, p. 523; Ent. iv, 73, p. 30, t. 4, fig. 45; *abbreviata* Germ., Ins. Spec. nov. p. 523; Zenk., Dej. Cat. 3 ed., 382; *limbata* Knoch., in litt.; *semivittata* Kb., Fn. Bor. Am. iv, p. 88.

Length 10–13 mm.; .40–.52 inch. *Hab.*—Canada, New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Virginia, Georgia, Alabama, N. Illinois, Michigan, Louisiana, Maine, Wisconsin.

**L. pubera** Say, 1827, J. A. P. v, 2, p. 279.

Length 9–10 mm.; .36–.40 inch. *Hab.*—New Hampshire, Pennsylvania, Virginia, N. Illinois, Michigan, Massachusetts, Canada West, Lake Superior, Georgia, New York.

**L. sphæricollis** Say, 1827, J. A. P. v, 2, p. 280; *discicollis* Dej. Cat. 383; *allecta* Newn., Ent. 1841, p. 72; *ruficollis* Say, J. A. P. iii, 1823, p. 421; *collaris* Melsh., in litt.; *paupercula* Newn., Ent. p. 72.

Length 7–8 mm.; .28–.32 inch. *Hab.*—Canada, New Hampshire, Massachusetts, New York, Ohio, Kentucky, Michigan, Lake Superior, Pennsylvania, Canada West, Maine.

The name *sphæricollis* is later than *ruficollis*, but is preferred, as being descriptive of the species rather than a special form thereof, like *ruficollis*, which is retained for the form it suggests, viz.: that with red thorax.

**L. vibex** Newn., 1841, Ent. p. 72; *nitidicollis* Horn, Proc. Ac. Phil. 1860, p. 570, t. 8, fig. 5.

Length 6–10 mm.; .24–.40 inch. *Hab.*—Canada, New Hampshire, Connecticut, Pennsylvania, Ohio, Michigan, New York, West Virginia.

**L. aurata** Horn, 1860, l. c.

Length 9 mm.; .36 inch. *Hab.*—Pennsylvania, North Carolina, Virginia.

**L. scripta** Lec., 1869, Ann. Nat. Hist. iv, p. 384.

Length 6–9 mm.; .24–.36 inch. *Hab.*—Vancouver, Washington, Oregon, Nevada.

**L. gnathoides** Lec., 1873, S. M. C. No. 264, p. 228.

Length 9 mm.; .36 inch. *Hab.*—Washington, Oregon.

A rare and very peculiar species, resembling *Gnathium minimum* of the *Meloidæ*.

- L. valida** Lec., 1857, Ent. Rep. p. 64, t. 2, fig. 14.  
Length 22 mm.; .88 inch. *Hab.*—California, Nevada, Oregon, Vancouver.  
The largest of our *Leptura* after *gigas* and *emarginata*.
- L. mutabilis** Newm., 1841, Ent. p. 71; Lec., J. A. P. ser. 2, i, p. 340; *luridipennis* Hald., l. c. p. 63; Dej. Cat. 3 ed.  
Length 8–13 mm.; .32–.52 inch. *Hab.*—New Hampshire, Massachusetts, New Jersey, New York, Pennsylvania, Michigan, Canada.  
The species with testaceous elytra were called by Haldeman *luridipennis*, but a large series shows such gradations that it is inconvenient to attempt any separation.
- L. quadricollis** Lec., 1850, J. A. P. ser. 2, i, p. 339.  
Length 8–9 mm.; .32–.36 inch. *Hab.*—Massachusetts, Vermont.  
Very rare, and doubtfully distinct from *mutabilis*.
- L. aspera** Lec., 1873, S. M. C. No. 264, p. 228.  
Length 9–13 mm.; .36–.52 inch. *Hab.*—Canada, Michigan, Colorado, Idaho, Vancouver.
- L. cubitalis** Lec., 1861, Proc. Ac. Phil. p. 355.  
Length 8 mm.; .32 inch. *Hab.*—California.

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### Association of Official Economic Entomologists.

The second annual meeting of the Association of Official Economic Entomologists will be held at the university buildings, Champaign, Ill., November 11th to 15th, proximo, at the same time as the meeting of the Association of Agricultural Colleges and Experiment Stations. The committee on Entomology of the latter association will meet at the same time.

Members expecting to attend will confer a favor upon the officers if they will announce the fact, and will send titles of papers to be read, or topics they desire discussed, to the secretary.

All are earnestly requested to be present if possible.

JOHN B. SMITH, *Secretary*.

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A series of studies made upon the mouth parts of DIPTERA indicate a homology different from any previously accepted. Thus far I have examined a large number of families, and have succeeded in distinguishing all parts of the labium, including the palpi, and all parts of the maxilla. The labellæ and the operculum are modifications of the galea. The slides are all made, the drawings are in an advanced state of preparation, and the paper will be ready early in October if all goes well.—J. B. S.

# ENTOMOLOGICA AMERICANA

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No. 11.

## THE BLACK PEACH APHIS.

A new species of the genus *Aphis*.

By ERWIN F. SMITH, Sc. D., Washington, D. C.

(Continued from p. 103, vol. vi.)

My attention was first called to this aphid in the Summer of 1887. Since then I have observed it repeatedly, my line of scientific inquiry having kept me in the peach orchards of the eastern United States almost continuously each year during the season of growth. I saw it first upon the roots of the peach and did not find any upon the parts above ground for more than a year.

This aphid is not restricted to any portion of the root system, but it prefers the smaller and younger fibres which admit of easy puncture. Upon these the insect congregates and multiplies. Sometimes the rootlets are entirely covered for an inch or two and completely sapped, the remoter portions becoming flabby and devitalized. Generally, however, I have found these root aphides in smaller colonies; sometimes it has required much digging to find any; and in a few instances I have failed altogether, when, from the appearance of the trees, I had every reason to suspect their presence. From these observations I conclude that they are more abundant at certain times of the year than at others. The character of the soil also appears to have some influence on their prevalence. They are most abundant and most destructive on light sandy lands, such as occur in southern New Jersey, and in the middle and southern parts of the Chesapeake and Delaware peninsula. I have, however, seen them on roots taken from the stiff clay a foot below the surface.

I saw them first in July, 1887. Since then I have found them on the roots in August, September, October, November, April and May. Experienced peach growers tell me that they have also seen them on the roots in December, January and February. Of their presence on the roots in mid-Winter, I think there can be no reasonable doubt. I believe it as firmly as anything I have not myself observed. During the last four years I have found them in seven counties on the Chesapeake and Delaware peninsula, and have also seen them on the roots of peach-trees in southwestern Michigan (1889). Altogether, I suppose I must have found them on the roots at least fifty times.

Upon the parts above ground I did not observe the insect until the fall of 1888, although I had looked for it repeatedly in many orchards. It should be stated, however, that my observations in this part of the United States were limited both years to mid-Summer and Autumn, while the forms above ground are most prevalent in the Spring. Even in 1888 I saw only two or three small colonies, and these were confined to one nursery. On the roots of the same trees, however, they were quite common at this time, and also during the next Summer.

In the mild Winter of 1888-89, colonies began to appear upon the branches of the peach long before any buds swelled. These colonies continued upon the branches and increased in number until some time in May. During that month they were in nearly every orchard which I visited. In many orchards they were prevalent enough to cause uneasiness, especially in the early part of the growing season when the leaf buds first opened. However, they did no serious injury, and in Autumn when I returned they were gone from the parts above ground, but were plentiful on the roots.

The Winter of 1889-90 was milder than the preceding one. In fact, throughout the eastern United States it was a remarkable Winter in many respects. Very little snow fell in the latitude of Washington, little or no ice was harvested south of New York City, and the mean Winter temperature was many degrees above the normal. Peach buds began to swell in January, and many trees blossomed in February. The orchards of upper Maryland and Delaware were in full blossom March 31st, several weeks earlier than usual. The mild weather seems to have greatly favored the multiplication of this peach aphid. I first heard of it on the branches about Christmas, and received the first specimens January 7th from Still Pond, Maryland. These Winter colonies continued on the branches until Spring opened.

In the Spring and early Summer of 1890, this aphid was again in the orchards wherever I went, and in much larger numbers than the year before. It was also sent to me, or reported to me, from southern New Jersey, Virginia, the west shore of the Chesapeake in Maryland, and from southern parts of the Chesapeake and Delaware peninsula, which I was unable to visit. I could not, however, learn of its presence in any part of the extreme South, although I made diligent inquiry of many peach growers, and supplemented this by personal observation during June and July in the orchards and nurseries of middle Georgia. In Delaware and Maryland, and parts of New Jersey and Virginia, this aphid was reported everywhere to be unusually prevalent and destructive. In April, when the leaf buds were pushing, I saw them clustered upon so many shoot-axes, and so compactly, as to kill young trees, and even very considerable branches upon older trees. They were especially destructive to nursery trees and to orchards just planted. I saw one nursery in which at least 100,000 trees had been killed outright in two or three weeks' time. I also heard of half a dozen large nurseries which were entirely destroyed or very seriously affected, and of orchardists who will be compelled to replant hundreds of trees.

In the upper part of Maryland and Delaware, these aphides were less destructive than on the sandy lands of Sussex, Caroline, Calvert, and other southern counties. Toward the end of May they had almost disappeared, owing in part, at least, to the attacks of Coccinellidæ and other enemies. By mid-Summer they had disappeared completely, but were to be found on the roots as usual.

There can be no doubt, I think, as to the identity of the ærial and subterranean forms. They are alike in every important particular,—in structure as well as in color. Indeed, it would puzzle any one to tell whether a given specimen came from above ground or below. I have found colonies of identical appearance, macroscopically and microscopically, on outer limbs, on short spurs of main branches, on the trunk near the earth, on the collar just beneath the surface, and on all parts of the root system. Moreover, there are biological as well as morphological reasons for believing the two forms identical.

This aphid is visited by several ants, and is specially fostered by *Lasius claviger* Roger, a yellow species. These ants live in the earth of peach orchards, and I have seen them carry the underground form from place to place when the roots have been disturbed. If they do this when the aphides are molested, they undoubtedly do it at other times; and, if such are their habits under ground, very

likely the aphides are also carried to parts above ground, which these ants also frequent. That they actually bring the aphides out of the earth has not been established by observation, but there can be no reasonable doubt. It is probable that many, at least, of the colonies which appear on the parts above ground in the early Spring have not come from Winter eggs, but from the root-infesting pseudogynæ. I believe this to be true for the following reasons: 1, The wingless viviparæ are to be found on the roots at this season in company with an ant which takes a very special interest in them; 2, The same form generally appears above ground first upon short spurs which have recently grown from the trunk and lower branches near the earth, and migrates to remoter parts of the tree only after several days or weeks; 3, In the Spring of 1890, in an old, root-infested orchard, they appeared upon the chance seedlings which were coming up all over the orchard, just as soon as they did upon the older trees. This orchard was plowed a few weeks previous, after which the stones germinated and the seedlings pushed through the furrows. They attacked the young plants as soon as they reached the surface of the earth, and probably before. I examined a great many of these tiny seedlings and found every one infested. At this time, in this orchard, colonies were just beginning to appear upon short succulent growths on the trunk and lower limbs, but none could be found upon the upper and outer limbs until considerably later. There is no reason to suppose that the colonies which I found on the seedlings at the surface of the earth and under it, crawled from the distant tops of the older trees, or were carried from them. It is much easier to think of them as coming from the infested network of roots only a few inches away. In both cases I think the aphides crawled out of the earth, or were brought out by the yellow ant.

I first collected the winged viviparous form at Still Pond, Md., in April, 1889. Soon afterwards I took it at Dover, Del., and continued to find it till June. In 1890, it was sent to me from Calvert County, Md., as early as April 14th. At Dover I could find none until April 23d, and even then those which I obtained were from a limb plucked three days previous and kept in the house, where it dried up gradually. The disappearance of the food supply probably hastened the metamorphosis, for there were none on the branch when it was brought in, and none to be found in the orchards until some days later. At Still Pond I found it abundant from May 5th to 19th. It was also plentiful at this time in orchards around Dover. A few days later I saw it in Caroline County, Md., but both forms were then becoming scarce.

Prof. Uhler believes the eggs are deposited in Autumn under the bud scales. I have not observed these, nor taken the male or female. The Autumn forms are probably not very abundant, save in exceptional years or locations.

This aphid has been called "The peach phylloxera," and the injuries due to it are very considerable. The "Yellows" itself has been ascribed to it, but on insufficient evidence. On the whole, it is more to be dreaded than the borer or the curculio. Often, however, its ravages are overlooked or ascribed to other causes, because they are carried on underground. But when, owing to favorable seasons or other causes, they appear above ground in great numbers, as in 1874 or 1890, they attract general attention and cause much alarm.

After one season in the orchards I could pick out root-infested trees with little difficulty. Generally, such trees are badly dwarfed, and make only a feeble, sickly growth. The leaves are light green or yellowish, more or less rolled at the margins, and red or purple spotted from the attacks of fungi. Frequently I have seen three-year old trees so badly infested that they were only a little larger than when set. The farmer prunes, tills, and coaxes such trees to no purpose. They will not thrive. If this sort of root pruning is pushed far enough, *i.e.*, if the aphid is very abundant, the tree dies outright. Frequently, another tree set in its place succumbs in the same way, and another still, so that certain portions of the orchards get the evil reputation of being "dead spots," yet such spots are not "dead" to vines or other fruit trees.

As already stated, nursery trees and young orchards are especially subject to injury by this aphid. If orchards pass through their first two years in safety, they become so vigorous that later attacks are not very harmful. The greater part of the mischief is done soon after planting, or at least before the trees are extensively rooted. I have known orchards in which several hundred trees were killed the first or second season, and have heard of many such. In most of these cases the roots were badly infested, while the parts above ground were not molested. Very badly infested orchards also occasionally outgrow the injury and become profitable. I have known of several.

The wide spread occurrence of this insect under ground will account for much of the trouble experienced in starting new orchards in certain old peach regions. Very few peach growers have any adequate notion of its prevalence. Extensive observation has convinced me that few orchards along the Atlantic coast from New

Jersey to Virginia are wholly exempt from it. In connection with this fact lies the explanation of another one now generally accepted by Maryland and Delaware growers, viz.: *that young trees do not thrive when set in old orchards, or in their immediate vicinity.* This statement appears to be true; and yet it is in marked contrast to the experience in Michigan, where, for more than ten years, thousands of young trees have been set successfully in place of old trees which were removed on account of yellows or for other reasons. I can only explain this contradiction by supposing the insect to be rare in Michigan. Along the Atlantic coast this aphid deserts the roots of old trees for the more succulent tissues of young ones whenever there is an opportunity. If it were abundant in Michigan the results of replanting would probably be much less satisfactory and more in harmony with the experience of eastern peach growers.

Save in exceptional years, when young orchards have suffered seriously, and when whole nurseries have been destroyed, the injury to the parts above ground is inconsiderable. The Spring of 1890 was one of these exceptional periods. The aphid appeared before, or soon after the buds germinated, and was so abundant that hundreds of shoot-axes dried up and died before they were one-half an inch long. After a few weeks all of the older trees got the start of the aphides, but even on these I saw limbs one-fourth of an inch in diameter which died, because all of their growing buds had been destroyed.

Frequently, for years together, this aphid is not common enough above ground to attract any attention. Then, for a season or two, it will be very abundant.

Although I have not seen it in New Jersey, that is only because I have not traveled there extensively. It is well known to Jersey peach growers, and especially to nurserymen living in the middle and south part of that State, where, in time past, it has done great injury, and where it appeared this year in very considerable numbers.

Undoubtedly this aphid is often transported with nursery stock. Being on the roots when the trees are dug and packed, there is nothing to prevent its transportation. Indeed, unwittingly, I introduced it myself into one locality in Michigan along with nursery trees from Maryland, not, however, into a peach region. The next season it appeared on the branches and roots, but only upon the introduced trees. The same season, many miles distant, at South Haven and St. Joseph, in the southwestern part of the State, I saw peach-trees with the peculiar stunted appearance which I have so frequently seen in the East. I pointed out this similarity to various gentlemen, and,

upon examining the roots, we found the black aphides as I had predicted. None of these gentlemen had ever seen or heard of this insect, nor could I find any Michigan peach grower who was better informed. There were not many cases at either place, and all of them were young trees recently introduced from New Jersey.

This aphid seems to be a native of the United States. I can find no account of it, or of anything like it, in European literature. It is by far the most abundant of our peach aphides. In comparison, *Myzus persicæ* is very rare. I believe this insect was confined originally to some native plant, and has migrated from that to the peach, finding the latter more congenial. If so, what is this wild plant? As stated already, careful search on the tops and roots of many weeds proved fruitless. Additional examinations of hundreds of cherry trees made in the worst infested peach districts of Maryland and Delaware, since the writing of Part I, brought to light no new facts. There were some colonies of *Myzus cerasi*, but none of this insect.

I did find it, however, upon the wild *Prunus chicasa*, and on the cultivated wild goose plum. This was in Kent County and Caroline County, Maryland, in May, but after the first part of this paper was in type. I also saw it sparingly on Damsons and other types of plum. On *Prunus chicasa* it was common on the roots as well as the branches. From what was seen at that time and gathered by inquiry, I infer that it is as much at home on the Southern wild plum and its cultivated varieties as it is on the peach, but that it attacks other types of plum only exceptionally. It is possible, therefore, that *Prunus chicasa* was the original food-plant of this injurious insect, and that it has migrated to the peach in recent times.

The practical point for the fruit grower is to know how to destroy the insect.

There is probably no certain way of reaching the aphid under ground, although some claim to have driven them away by the use of very strong stable manure. When the trees have been stunted, the best thing is to pull them out and plant others. I have sometimes thought an insecticide bath might be provided for dipping the roots of suspicious trees before planting, but I have no suggestions to offer.

When the insect is on the parts above ground it can be disposed of effectually by procuring a force pump with a cyclone nozzle and spraying the foliage with insecticides.

Charles Wright, of Seaford, Del., saved his nursery last Spring by the application of strong tobacco water. One spraying sufficed.

Other nurseries in Sussex were nearly ruined, and from the great abundance of the aphides he thinks his own trees would have been destroyed but for very prompt action.

Prof. John B. Smith also informs me that he had excellent success at Vineland, N. J., in the use of whale-oil soap,—one pound to eight gallons of water. One spraying took off most of the aphides, and another, a day or two after, finished the work without injury to the foliage.

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### FIRE!

On the night of Friday, the 13th of September, a fire broke out in the roof of the Brooklyn Institute, in whose building the Brooklyn Entomological Society holds its meetings, and where were stored its library, collections and publications.

In the building were also the collections of Prof. Julius E. Meyer, and the library and collections of the assistant editor.

Prof. Meyer's collection, an exceedingly valuable one of Lepidoptera, was slightly damaged. With the exception of a few cases, injured by water, the collection proper is practically entire. His boxes of duplicates were almost entirely destroyed.

The main part of the collection of the assistant editor was contained in a large cabinet, the four doors of which were fortunately closed, and it thus escaped injury. An immense mass of unarranged and unmounted material, mostly in cigar-boxes, was more or less injured. The water and the dampness of the week succeeding the fire, damaged a large part of his library. The loss was estimated at about \$1000. No insurance.

The entomological collections of the Institute, all of which were insured, including those formerly the property of Dr. Calverley and B. Jaeger, and of Maj. J. Carson Brevoort, were more or less damaged, as were also several cases belonging to the Society.

The Society's library, and its large stock of publications, were uninjured, with the exception of a lot of current publications that were in use in another room.

It was found necessary to remove all of the effects from the Institute building, and they were soon moved a second time. As a consequence, the Society's library and publications were necessarily disordered, and it will be some time, it is feared, before they can be rearranged.

Temporary quarters have been secured in the Hoagland Laboratory, at the corner of Pacific and Henry Streets, Brooklyn, where the Society will hold its meetings until further notice. F. H. C.

## Preparatory stages of *Heterocampa subrotata* Harvey.

BY HARRISON G. DYAR.

The eggs were not observed, but I believe I have found the larva in its first stage, which is as follows:

FIRST STAGE.—Head depressed at the vertex, dark wine-red. Width .6 mm. Body cylindrical, smooth and shining, but annulated anteriorly. Feet normal, the anal pair elevated and rather long, the claspers apparently aborted, or perhaps withdrawn in the ends of the legs as in the mature larva. Cervical shield large, bearing a pair of horns like antlers, three branched, the branches curved and diverging, with a shorter spur near the base of the horn, all dark blackish brown. On joints 5-10, 12 and 13, from elevated shining bases grow a pair of similar, but more slender horns, not branched, but knobbed a little beyond the middle and bent, knobbed again at the end and terminating in a hair; those on the last segments are rather shorter, and all, with the anal feet, are dark blackish brown. Body dark wine-red, finely streaked at the sides with yellow longitudinally, paler ventrally. On joints 3 and 4 the streaks continue over the dorsum, confluent in a dorsal band; on joints 8, 9 and 10 is a narrow yellow line between the bases of the horns, and on joint 11 a large bright yellow dorsal patch. Length about 7 mm.

SECOND STAGE.—Head subtriangular, notched on top, dark wine-red. Mouth and triangular plate (clypeus) paler shaded; maxillæ black. Width 1.1 mm. From the cervical shield a pair of branching horns with small spur, all relatively smaller than before, the branches hardly more than large spurs, minutely transversely creased, dark wine-red. The body lacks all the other horns and the anal feet are long. Body wine-red, finely streaked with yellow on the sides, and also on the back on joints 3, 4 and 13. An interrupted yellow dorsal stripe, widening on joints 10 and 11, and ending abruptly at the end of joint 11, absent on joints 2, 5 and 7. Anal plate and all the feet dark. As the stage progresses joints 2-4 become pale green, except a narrow wine-red dorsal line. The subventral region on joints 5, 6, 8 and 9, and a broader area on joints 11-13 is pale greenish.

THIRD STAGE.—Head parabolic in outline, flat in front, and notched a little at the vertex; wine-red, closely covered with little, round, pale, yellowish spots, partly confluent posteriorly. In front a broad, pale, yellow, vertical band, widening inferiorly to the width of the base of the triangular plate, its sides once indented by the red ground color above the middle and the sutures also red. Labrum

and antennæ pale; eyes black. Width 1.7 mm. The horns on joint 2 are three spurred, wine-red, punctured; markings much as in the last stage. A yellow dorsal band forms a triangular patch on joint 2, narrows almost to obsoleteness on joints 3 and 4, widens again on joints 5-8 and ends triangularly. It begins again in the middle of joint 9 and widens on joints 10 and 11, where it ends abruptly, excavated so as to appear furcate. It is very narrowly and faintly continued on joints 12 and 13, and is bordered on both sides by a broad wine-red band, which contains fine yellow streaks, and is continued twice downward to the feet, on joints 5 and 4 obliquely, and on joints 7 and 10 straight. The rest of the body is pale greenish. Anal feet long, wine-red. Length 12 mm. As the stage progresses, the markings approach those of the next stage.

FOURTH STAGE.—Head shaped as before, dark red-brown, the indented band in front pinkish; triangular plate white; antennæ yellow; a darker band on the head posteriorly, otherwise as before. Width 2.1-2.6 mm. The body is nearly cylindrical, enlarged dorsally (arched) at joints 8 and 9, and tapering thence to joint 13. Anal feet long, not used in walking; two three-spurred cervical horns red-brown, punctured, and tipped with a hair, only about 1.5 mm. long. Body leaf green, the dorsal band yellow between the horns, elsewhere white, distinct. It widens posteriorly to joint 7, narrows abruptly to a point on joint 8, begins again on joint 9, widening to joint 11, where it divides into two parts, which meet at the anal plate, enclosing an elongated oval patch of the ground color. Anal feet white above, brown below; three lateral brown spots mottled with yellow, the first oblique on joints 4 and 5, narrow; second on joint 7 and partly on joint 8, large, extending from the dorsal band to the foot of joint 7, darker subventrally; the third smaller, on joint 10 a little oblique and not reaching either the foot or dorsal band; some minute black spots over the lateral region. Spiracles on joint 2 reddish. Thoracic feet brown, abdominal with a fine brown band. Length 22 mm.

FIFTH STAGE.—Head shagreened, purplish brown, the apices of the lobes black. In front is a broad, pink, vertical stripe a little irregular in outline, very narrowly divided by the darker central suture and becoming white behind the vertex. Triangular plate white, labrum pinkish; maxillæ black, antennæ brown, their conical base yellow, ocelli black. Width of head 3.3-3.8 mm. Cervical horns absent, their places represented by a pair of minute tubercles bearing each a single hair. The body is smaller at joints 5 and 6, enlarged dorsally at joints 8 and 9, and slopes again to joint 13. Anal feet rather

long, held out straight, their tips slightly retractile, but armed with hooks. A white dorsal stripe finely margined with dark brown and containing in its widest places a fine double line, is yellowish anteriorly on joint 2, widens on joints 4-6, and ends on joint 8. It begins again on joint 9, yellowish; widens, forks on joint 11, the parts converging on joint 13, and passing on to the anal feet, but not meeting. Body leaf green, with many small black dots and three purple-brown lateral patches mottled (especially the upper part of the last two) with crimson or pale crimson, which later becomes pale pink or cream color. The first on joints 4 and 5 upwardly oblique, covering the spiracle on joint 5; the second large, on joints 7 and 8, covering the foot on joint 7, not reaching below the spiracle on joint 8, but attaining the dorsal band; the third, on joint 10, covering the spiracle, downwardly oblique posteriorly and passing on to the foot. Anal feet purplish, thoracic brown ringed with black, abdominal tipped with brown. Spiracles yellowish centrally, broadly brown outwardly. As the stage advances a diffuse, white, subdorsal band appears on joints 8-10, tapering at each end and forming a continuation of the widest places of the dorsal band, but narrowly separated from it, or only partly confluent, but there is considerable variation in this character in different examples; also a narrow white dorsal line encroaches on the anterior part of the green patch formed by the furcation of the dorsal band on joints 11 and 12, while the anal plate, between the branches, is brown. The fine lines in the white dorsal band become pulverulent, thus approaching in appearance the numerous black dots of the lateral region. In the upper part of the third lateral patch a round, cream-colored spot appears, formed by the confluence of the mottlings. Length 30 mm.

**COCOON.**—Formed under rubbish, or just under the surface of the ground of silk and grains of dirt. It is thin and of no strength.

**PUPA.**—Cylindrical and slightly tapering. The cremaster consists of two thick spines from an elevated base, curving sharply outward and beset with several thorn-like branches. Body punctured, cases smooth. Color dark red-brown, polished. Length about 20 mm.; width 6 mm.

Duration of this stage: first brood, 14 days; second brood, over Winter.

**FOOD-PLANTS.**—Witch Hazel (*Hamamelis*), Hickory (*Carya*), Maple (*Acer*), Birch (*Betula*), Dogwood (*Cornus*), and probably others. The Witch Hazel seems to be the most usual food-plant, and the larva is very inconspicuous upon this plant when seen from above in spite of its bright markings, as it resembles the curled and

discolored patches of the leaves, the green lateral part of the body joining nicely to the edge of the leaf, where the larva rests. From below, however, it is readily seen, as it does not harmonize with the pale under sides of the leaves, but as it is not likely to be looked at from below, especially by birds, it would readily escape observation.

The structure of the anal feet is interesting, as illustrating the first stage in the development of *stemapoda*. They are rather long, and, though furnished with hooks, the ends can be withdrawn, just concealing the hooks as is constantly done by the larva without apparent cause. A series might be made beginning with this species through *Heterocampa unicolor* and *H. marthesia* to *Cerura*.\*

Larvæ from Dutchess County, N. Y.

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## A NEW MORRISONIA.

BY JOHN B. SMITH.

**Morrisonia rileyana** sp. nov.—Head, thorax and primaries, in ground color, grayish white, with a ferruginous tinge. Palpi with a strong admixture of brown scales in their clothing. A rusty red-brown line crosses the front below the antennæ. Collar tipped with powdery black. Patagiæ black, powdery. Thoracic tufts tipped with rusty. Primaries with a broad, black, longitudinal shade, running beneath the median vein to t. p. line, then broadening to outer margin, which it reaches below the apex. Along the inner margin an irregular, narrow, whitish border only, is left. A ferruginous spot is in this black shade in the terminal space. Above this black shade the cell is filled with a rusty wash, in which the reniform is very faintly outlined by a narrow ring of the ground color. T. a. line geminate, vague, diffuse; traceable in costal region only. T. p. line geminate at inception, very oblique outwardly through costal region, becoming punctiform below and traceable through the black shade by pale venular dots. Secondaries white basally, with a broad powdery black margin outwardly; a vague discal lunule, an outer line of venular dots and a black, interrupted terminal line. Beneath white, with ferruginous, and a sparse black powdering; a common punctiform outer line, and a black discal spot, most distinct on secondaries. Expands 31 mm.; 1.25 inches.

*Hab.*—Florida.

I have seen two specimens of this species, one in Dr. Riley's collection (coll. U. S. Nat. Museum), the locality of which I do not remember, and one from Mrs. Slosson, taken in Florida. The insect is a strongly marked one, of the same general type of maculation as in the remaining species, but yet evidently distinct. The male characters have not been examined.

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\* See Packard, Proc. Boston Soc. Nat. Hist. vol. xxiv, p. 549.

## SYNOPSIS OF CERAMBYCIDÆ.

BY CHARLES W. LENG, B. S.

(Continued from p. 200, vol. vi.)

### EURYPTERA Serville.

**E. lateralis** Oliv., 1795, Ent. iv, 73, p. 22, t. 3, fig. 37; Lec., 1850, J. A. P. ser. 2, i, p. 335; *cincta* Hald., 1847, Trans. Am. Phil. x, p. 63; *obsoleta* Hald., l. c.; *distans* Germ., Ins. Spec. nov. 1824, p. 524; Lec., l. c.; *marginicollis* Dej., Cat. 3 ed. p. 381.

Length 9—10 mm.; .36—.40 inch. *Hab.*—Pa., Ky., La., Fla., Mass.

This insect is similar to the *Lepturæ* in general appearance, and is entirely black, except the mouth parts, sides of thorax above and beneath, humeri and half the epipleuræ red. Thorax narrowed in front, posterior angles acute and distinct. Elytra densely punctulate.

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Before entering upon the last great division of the family, it is proper to mention certain species which have been discovered since the tribes they enter were treated. These are:

**Hypexilis pallida** Horn, Trans. Am. Ent. Soc. xii, 177.

Length .22 inch.; 5.5 mm. *Hab.*—Texas.

“Slender, pale testaceous. Head across the eyes wider than the thorax, surface coarsely punctured. Thorax elongate, one-third longer than wide, sides at apical third parallel, then gradually wider to two-thirds, arcuately narrowing to base, which is slightly wider than the apex, disc slightly flattened posteriorly, surface rather coarsely punctured and rugulose. Elytra wider than the thorax, humeri distinct; sides straight, slightly converging; apices separately rounded, suture at tip slightly dehiscent, disc rather flat, a vague elevation from the humeri to near the tip; surface evenly and closely punctate, more finely than the thorax. Thorax beneath coarsely, but sparsely punctate; abdomen shining, very sparsely punctate.”

**Gracilia obliquata** Horn, l. c. p. 174.

Length .20 inch.; 5 mm. *Hab.*—Texas.

“Form slender, pale brownish testaceous, subopaque. Head behind the eyes moderately coarsely punctate. Thorax oval, a little longer than wide, slightly narrower at base than apex, sides moderately arcuate, disc feebly convex, a vague median sulcus and one on each side, oblique, slightly in front of middle; surface moderately coarsely punctate. Elytra slightly wider than the thorax; sides parallel, apices separately rounded, disc subdepressed, a vague oblique depression on each side from the humeri to the suture; surface finely pubescent, rather sparsely punctate, the intervals very finely granular, apices nearly smooth. Thorax beneath coarsely not closely punctate; abdomen moderately shining, very sparsely punctate. Femora very strongly clavate.”

**Necydalis barbaræ** Rivers, Ent. Am. vi, p. 112.

Length 22 mm.; .87 inch. *Hab.*—California.

The description of this species having been recently printed in this journal, need not be here repeated.

**Elaphidion cinereum** Oliv., Ent. iv, 70, p. 69, pl. 8, fig. 102; Chev., Ann. Fr. 1862, p. 261; *fuscatus* Dej., Cat. 3 ed. p. 352.

Length .28—.44 inch.; 7—11 mm. *Hab.*—Cuba, So. Fla., Key West.

This species was collected at Key West by the late Mr. Morrison.

"Pale brown, clothed with dense gray pubescence; elytra marked with a brown longitudinal line" (Oliv). The antennal joints 3-7 are unispinose at tip, the thighs and elytral tips are unarmed. The femora are slightly more clavate than is usual in *Elaphidion*. In addition to the brown elytral line described by Olivier, there is usually a second line and an obscure cloud behind the middle of the elytra and several brown lines upon the thorax.

**Elaphidion lanatum** Chev., Ann. Fr. 1862, p. 260.

Length 4—5.5 mm.; .16—.22 inch. *Hab.*—Cuba, So. Fla.

"Elongate, convex, clothed densely with grayish white hair; antennæ with joints 3—10 bispinose, the spines decreasing in length. Thorax rounded, marked with a smooth medial line and two small black anterior tubercles; elytra moderately convex, declivous behind, quadrispinose; body beneath and legs minutely and obsoletely irrorate with fuscous; ♀."

Has occurred with the preceding at Key West. Both species have been identified by Dr. Horn.

**Phymatodes juglandis** n. sp.

Resembles *P. decussatus* Lec. differing by the coarsely punctate elytra and the very oblique and angulate anterior elytral fascia.

Dark brown; antennæ, underside and anterior portion of elytra lighter, the latter bearing two fasciæ, the anterior acutely angulate, the posterior broader, oblique and arcuate; the entire insect clothed with long fine hair, distantly placed, except on the elytral fasciæ. Head and thorax coarsely punctate, elytral punctures very strong. Thorax rounded and somewhat protuberant at sides, moderately convex on the disc; elytra parallel to one-third, thence slightly arcuately expanded to near the apex, which is broadly rounded, flattened on the disc. Antennæ ♂ about two-thirds as long, ♀ about half as long as the body.

Length 4.5—6.5 mm.; .18—.26 inch. *Hab.*—Los Angeles, Cal.

Several specimens sent by Mr. D. W. Coquillet to Dr. Horn, and by him kindly given to me. It is believed to live on the California Butternut (*Juglans californica*).

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## CORRESPONDENCE.

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In Mr. Leng's very valuable synopsis of *Leptura* which appeared in the October number of ENTOMOLOGICA AMERICANA, the rarity of *L. plebeja* Rand. is noticed. I have seen several examples from various parts of Canada, and have one in my collection, all of which were females. There is no good description of the species,

and Dr. LeConte's two lines in the synopsis referred to, reproduced by Mr. Leng, are all that can be depended on for its differentiation. The female has the last ventral segment convex, elongated, not greatly narrowed to apex, depressed posteriorly in the middle, and deeply, broadly, nearly rectangularly emarginate; the sides not being depressed project backwards like blunt horns, their apices with stiff hairs.

In regard to *L. hæmatites* and *exigua*, Mr. Leng has overlooked (it is to be regretted) Dr. Horn's latest determination from an examination of the types in the British Museum, according to which the species should be thus tabulated.

*L. exigua* Newm., *saucia* Lec.

*L. nana* Newm., prothorax and elytra concolorous.

var. *hæmatites* Newm., prothorax dull red.

See Trans. Am. Ent. Soc. xv, 301; Can. Ent. xxi, 32, 108.

In this connection it may not be amiss to state that there are two races of *L. vibex* Newm.—one with the thorax entirely black, and one with it entirely yellow rufous—found separately in different localities.

JOHN HAMILTON.

\* \* \* \*

Dr. Hamilton is quite right, and I am sorry, because it is an important error. The subjoined note may be added as a postscript to what he says, and will save the reader hunting up references.

“**L. exigua** Newm.—Antennæ piceous, the basal joint yellow; anterior femora entirely, the middle and posterior yellow at base. Terminal ventral segment of female with a slight tuberosity near the apical margin. This species may have the thorax entirely piceous, usually it has the entire margin yellow. The disc is also more densely punctured than in *nana*, while the form of the thorax is shorter and broader. *L. saucia* Lec. is synonymous.”

“**L. nana** Newm.—Antennæ always piceous. Anterior femora and base of middle yellowish. Terminal ventral segment of female simple.”

“This species varies in color. The upper surface is often entirely piceous. By far the larger number I have seen have a reddish thorax, constituting the variety *hæmatites* Newm. One specimen before me is piceous, with the head reddish yellow” (Horn, Trans. Am. Ent. Soc. xv, p. 301).

*L. aspera* Lec.—Mr. O. S. Westcott, of Chicago, has called our attention to a discrepancy in the synoptic table, in reference to this species, to correct which the words “except *aspera*” should be added to Section E on p. 186. It has been taken abundantly in British Columbia, and bears out the description made from a few specimens, being very black, and the elytra rough at base.

C. W. LENG.

## PREPARATORY STAGES OF SAMIA CYNTHIA Dr.

BY WILLIAM BEUTENMULLER.

EGG.—Oval, creamy-white, covered with an olivaceous green substance, used to adhere the egg to the leaf. Length 1.6 mm. Duration of this stage fourteen days. Laid in small masses of about twelve on the underside of leaf. Total number of eggs laid about 250.

YOUNG LARVA.—Head jet-black, shiny, smooth, mouth parts yellowish brown, mandibles pitchy brown; cervical shield black. Body yellow, with a series of two rows of black tubercles along the dorsal region, and one row along the subdorsal and another row along the sides below the spiracles also black. All the tubercles have at the apex three or four small spines, each bearing a rather long, sordid white hair. Along the spaces between each row of tubercles, is a row of black spots. Body beneath yellow, thoracic feet shiny, black; abdominal legs concolorous with the body, but with a black corneous patch on the outside of each. Over the head are also scattered a few sordid white hairs. Length 2.50 mm. Length two days old, 3 mm.; three days old, 5 mm.; four days old, 7 mm.; five days old, 7 mm.; getting ready to moult.

AFTER FIRST MOULT.—No perceptible change from the previous stage, except that the cervical shield is now concolorous with the body. Length 8 mm. (six days old); seven days old, 9 mm.; eight days old, 10 mm.; getting ready to moult.

AFTER SECOND MOULT.—All the tubercles in this moult are now yellow, except the lateral row remaining black. Head yellow, with a black spot on each side of the anterior part; mandibles pitchy black, otherwise the same as the preceding moult. Length 12 mm. (nine days old); ten days old, 14 mm.; eleven days old, 16 mm.; twelve days old, 19 mm.; thirteen days old, 21 mm.; getting ready to moult.

AFTER THIRD MOULT.—The body color is now pale whitish green, as are also the tubercles, except those along the side black, with their extremities whitish. Head and cervical shield yellowish green. Anal plates also yellowish green, margined with blue; underside greenish; also all the feet. The body and tubercles covered with a white powder. Length 23 mm. (fourteen days old); fifteen days old, 25 mm.; sixteen days old, 27 mm.; seventeen days old, 30 mm.; eighteen days old, 32 mm.; nineteen days old, 35 mm.; getting ready to moult.

AFTER FOURTH MOULT.—No difference, except that the body is somewhat deeper in color. Length 38 mm. (twenty days old); twenty-one days old, 40 mm.; twenty-two days old, 43 mm.; twenty-three days old, 46 mm.; twenty-four days old, 48 mm.; getting ready to moult.

AFTER FIFTH, THE LAST MOULT.—Body pale green, with the extremities of all the tubercles bright blue and the bases yellowish green. The row of tubercles along the sides black. Head and cervical shield same as in previous moult, also the anal plates. Thoracic feet yellowish green; abdominal legs with a bright blue patch at the base of the outside of each. Length 50 mm. (twenty-five days old); twenty-six days old, 52 mm.; twenty-seven days old, 54 mm.; twenty-eight days old, 56 mm.; twenty-nine days old, 58 mm.; thirty days old, 60 mm.; thirty-one days old, 62 mm.; full grown.

FOOD-PLANTS.—*Ailanthus* (Hop-tree), Tulip-tree, Barberry, Linden, Maple, Wild Cherry, Plum, Spireæ, Sweet Gum, Dogwood, Sassafras, Spicebush, Nannyberry, Holly and Caster-oil plant; also said to feed on Sumac, Pimpernel, Honey-suckle, Spindletree, Bitter-sweet, Laburnum, Willow and Celery.

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### Note on the genus *Protenor* Stal.

By E. BERGROTH, Forssa, Finland.

In his "Check List" Mr. Uhler has quoted the genus *Tetrarhinus* Prov. as a synonym of *Protenor* Stal. In his faunistic work on the Hemiptera of Canada, p. 335, Mr. Provancher protests against this synonymy in saying: "M. Ashmead a confondu ce genre avec le *Protenor* de Stal, mais ce dernier dit du *Protenor*: articulo primo antennarum capitatis apicem haud attingente."

This is a falsification of Stal's description. Stal says (*Ofv. Vet. Akad. forh.* xxiv, 1867, p. 543): "antennis -- articulo primo capite paullo brevior." There is, of course, quite another meaning in these words than in the ones substituted by the learned abbot, and there can be no doubt that Mr. Uhler was right in uniting *Tetrarhinus quebecensis* Prov. with *Protenor Belfragei* Hagl.

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"Among the Moths and Butterflies," is the title of a new book for young folks, by Julia P. Ballard, author of "Insect Lives." To quote a newspaper book review: "it is so fascinating that every child who reads it will at once begin to make a collection of caterpillars and cocoons."

F. H. C.

*Spider's Web Cloth.*—A new industry has sprung up by which spiders are added to the list of insects of importance in arts and industries, as witness the following excerpts from the *Washington Post*: An Englishman, named Stillbers, it is said, has actually made a cloth of spiders' web which has been employed for purposes of surgery, and has gone quite extensively into its manufacture.

The spiders are obtained from tropical countries, mostly from Africa and South America, and are very large. A peculiar feature of the business is that the spiders spin the best web when they are intoxicated. To accomplish this a liquid composed of chloroform, ether and fusil oil is allowed slowly to evaporate in the room where the spiders are housed, and they are thus kept constantly in a mild state of intoxication. The little creatures are placed in octagonal cases, and are fed on insects of various kinds. In one room there are some 5000 of these cases. The spiders lay their eggs, and about the latter spin cocoons. These cocoons are gathered, and are prepared for weaving by some such processes as are undergone by the cocoon of the silk-worm. The weaving itself is a closely guarded secret. Each cocoon is said to yield twenty-five to one hundred yards of thread. The texture of the woven material resembles, somewhat, ordinary silk, and after it is bleached it becomes brilliant and smooth.

F. H. C.

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*Eristalis tenax* has been unusually common in this vicinity during the year. It has been aptly termed the "drone-fly," not alone by virtue of its resemblance to the male honey bee, but on account of its habits. A large portion of its time appears to be spent simply in idling, flitting about from one flower to another with no apparent purpose in view.

F. H. C.

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*Zeuzera æsculi* (*pyrina*) mentioned in a previous number (p. 31) as occurring at Newark and Arlington, N. J., has been taken in Central Park, N. Y. City, by Mr. Beutenmüller, and during the Summer I found it also at Orange, N. J., at electric lights. Although the insect has been known for a number of years in this country, its spread has been inconsiderable. The addition of Central Park and Orange increase the radius of its occurrence to only about fifteen miles.

F. H. C.

## DESCRIPTION OF THE PREPARATORY STAGES OF DATANA ANGUSII G. and R.

BY WM. BEUTENMULLER.

EGG.—Ovoid, white, with the base slightly flattened; laid in small masses of about thirty, on the underside of leaf.

YOUNG LARVA.—Head and cervical shield jet-black, shining. Body greenish brown, with the second and third segments claret-red above and below. This color is also present on the dorsal region of the sixth, seventh, eighth and eleventh segments. The four stripes along each side of the body are pale lemon-yellow, except where they are obscured by the claret-red color. The stripes on the underside of the body are also pale lemon-yellow. All the stripes are equidistant, and as broad as the intervening spaces. Thoracic feet jet-black; abdominal legs same color as the body; anal clasps jet-black, shining. Length 3 mm. Duration of this stage about six or seven days.

AFTER FIRST MOULT.—The ground color in this stage is now somewhat darker, as is also the claret-red color of the segments as described in the young larva. Length 6 mm. Duration of this stage six days.

AFTER SECOND MOULT.—The body in this stage is of a purplish brownish color, with the stripes somewhat narrower than the intervening spaces. The claret-red color is now quite faint and suffused with the ground color. Body beneath same as above, with the abdominal legs concolorous with a black corneous patch on the outside of each. Length 9 mm. Duration of this stage eight days.

AFTER THIRD MOULT.—The stripes are now considerably narrower than the intervening spaces, and the body somewhat deeper in color, the cervical shield blackish, and abdominal legs pinkish. Length 16 mm. Duration of this stage nine days.

AFTER FOURTH, THE LAST MOULT.—Head and cervical shield jet-black, shining. Body black, with the four now pale yellow stripes along each side very narrow, all being much narrower than the intervening space. The three stripes on the underside are also now pale yellow; the one along the middle is the broadest, and the one on each side being broken by the legs; the intervening spaces much wider than those above. Thoracic feet jet-black; abdominal legs reddish, with the extremities black. On the fourth, fifth, tenth and eleventh segments are two reddish patches. Body with sparsely distributed, sordid white hairs, which are also present in all the pre-

ceding stages. Length 30 mm. Full grown larva 55 mm. Duration of this stage not observed.

FOOD-PLANTS.—Various species of Hickories, Walnut, Butternut and Beech.

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## A NEW COPIPANOLIS.

BY JOHN B. SMITH.

**Copipanolis stigma** sp. nov.—Head, thorax and primaries deep brick-red; palpi paler. Primaries with a slight admixture of yellowish scales, most evident along costal region. Median lines vaguely marked, scarcely defined; ordinary spots yellowish white; orbicular small, round; reniform moderate in size, rather irregular. Secondaries whitish at base, with reddish powderings, becoming more dense outwardly. Beneath somewhat paler than above, more obviously yellow powdered. Expands 1.15 inches; 29 mm.

*Hab.*—Florida.

A single male specimen from Mrs. Slosson's collection. The species is like *cubilis* in ground color, but lacks the distinct median lines, and, on the contrary, has the ordinary spots distinct, contrasting, yellowish white. In structure and habitus it otherwise resembles the typical species closely.

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## SOCIETY NEWS.

BROOKLYN ENTOMOLOGICAL SOCIETY.—September 2d. The meeting was occupied by an exchange of collecting and other entomological experiences. Mr. Dietz gave an account of the field meeting at Jamesburg, and Mr. Chittenden exhibited a series of rare species of Coleoptera, principally Carabidæ, taken at an electric light at Orange, N. J., in June.

October 7th.—Meeting at the Hoagland Laboratory. The time was largely taken up by business matters, much of it due to the fire, which destroyed part of the Brooklyn Institute building, and necessitated a removal of the property and effects of the Society. Fortunately, the Society's loss was slight.

Prof. Smith called attention to a series of studies on the mouth parts of Diptera, made by himself, and presented in outline a new nomenclature of parts, homologizing the lapping with the mandibulate mouth, and he told how the latter had become transformed into the former, all the steps being still traceable.

A. C. WEEKS,

*Recording Secretary.*

## NOTICE.

Publications received as exchanges, or as donations to the Society's library, should be addressed in future to the

BROOKLYN ENTOMOLOGICAL SOCIETY,

Hoagland Laboratory,

Brooklyn, N. Y.

# ENTOMOLOGICA AMERICANA

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No. 12.

## REVIEW OF THE NORTH AMERICAN SPECIES OF BYTHOSCOPIUS.

BY E. P. VAN DUZEE.

Genus **BYTHOSCOPIUS** Germar.\*

Head with the eyes as wide as the pronotum. Vertex short, of nearly equal length across its whole width, much deflexed and confounded with the front in a common convexity. Ocelli placed on the front of the face opposite the middle of the eyes, to which they are a little more approximated than to the hind margin of the vertex. Antennæ rather short, inserted under a prominent oblique ledge. Front in the ♀ rather convex, apex broad, forming a rounded lobe each side of the base of the clypeus. Clypeus broad, ovate, suddenly contracted at the base, narrowed to the apex, where the sides are somewhat compressed around the base of the rostrum. Loræ long and narrow, a little tumid. Cheeks narrow, forming a slender margin beyond the loræ, but not attaining the apex of the clypeus. An oval, minutely punctured area occupies each side of the front basally. In the ♂ the loræ and base of the clypeus are confused with the greatly swollen apex of the front, obliterating the sutures and imparting a square appearance to the face. Pronotum moderately convex, anterior margin rounded, posterior concave; lateral angles not prominent; latero-posterior angles rounded; surface covered with transverse ridge or rugose punctures arranged somewhat obliquely behind the eyes. Scutellum large, with a transverse impressed line before the apex and a nearly smooth area within the basal angles. Elytra surpassing the abdomen a little, the suture straight; costa feebly convex; membrane without an appendix; texture submembranous, nervures commonly distinct; ordinarily there are one basal, two discal, three anti-apical and five apical areoles. Wings membranous, nervures distinct, supernumerary cell wanting (see ENT. AMER. v, p. 166).

\* For generic synopsis see ENT. AMER. v, p. 166, September, 1889.

Genital characters: *Male*.—Ultimate ventral segment similar in form to the penultimate. Pygofers together broad oval, their suture nearly straight; the anal opening rather small, ovate. Styles slender, flaccid, about half the length of the pygofers. Plates a little longer than the styles, narrow, ligulate, slightly contracted toward their base and curved to correspond to the form of the pygofers, sparingly ciliated with soft hairs.

*Female*.—Ultimate ventral segment various in form, affording good specific characters. Pygofers rather slender, about as long as the venter, without bristles in our species.

The species of this genus exhibit but slight structural differences, but are subject to great variation in color, this rendering them a difficult group to study. They are well represented in my own collection, and I have examined considerable material received from correspondents, and believe our species are here pretty accurately defined so far as they are known to me. Three of these—*fenestratus*, *minor* and *pruni*, are very closely related, and will probably prove to be but forms of a single variable species. The males of most of the species differ but little, and are difficult to separate without the corresponding females. The male of *sobrius* is unknown to me; the sexes of *variabilis*, *fenestratus* and *nigrinasi*, I have taken *in coitu*; of *distinctus* there can be no question, and the males of *cognatus*, *minor* and *pruni*, I think are correctly referred.

Two described North American species of this genus are still unknown to me, viz.: *fagi* Fitch and *flavus* Walker, and there are doubtless many undescribed forms yet to be brought to light by our collectors. In geographical distribution this genus is largely boreal, such species as do occur in the South seeming to be mountain-loving forms. All the species that have thus far passed through my hands are to be found in western New York. They live on trees, from which they can best be obtained by beating over an umbrella.

I am greatly indebted to Mr. P. R. Uhler for the loan of his very valuable material in this genus, and as well to my other correspondents who have responded so generously to my application for material.

The following synoptic table is based largely on the form of the ultimate ventral segment of the female, and is intended solely for the species hereinafter described:

### Synopsis of the Species.

1. (2) Elytra with four apical and two anti-apical areoles; brown or piceous, elytra maculated, beneath yellow . . . . . 3. **distinctus.**
2. (1) Elytra with five apical and three anti-apical areoles.
3. (6) Last ventral segment truncated, rounded or subtriangular, with an apical notch, but without projecting teeth.

4. (5) Last ventral segment short, with a broad shallow notch. 8. **nigrinasi**.
5. (4) *a.* Last ventral segment long, rounded, with a deep notch; ♂ black, ♀ sulphur-yellow, commonly marked with black. 1. **variabilis**.  
*b.* Last ventral moderately long, subtriangular with a shallow notch, color fulvous brown . . . . . 2. **sobrius**.
6. (3) Last ventral segment produced in a more or less distinct tooth each side of the apical notch.
7. (8) Last ventral segment cylindrical, notch widened, almost obsolete, the short teeth when present incurved, disc with a broad, shallow depression; gray, elytra subhyaline, maculated on the suture. 4. **cognatus**.
8. (7) Last ventral segment more or less distinctly triangular, with the apical teeth usually distinct.
9. (12) Elytra clouded, fenestrate with subhyaline ♀.
10. (11) Pale fulvous, or cinereous-fulvous; last ventral segment shorter, teeth small . . . . . 7. **minor**.
11. (10) Cinereous, or fulvous-brown, last ventral segment longer, teeth large. 5. **fenestratus**.
12. (9) Elytra hyaline, nervures brown, a discal spot, and commonly the apex, clouded; vertex piceous, with a yellow band connecting the ocelli. 6. **pruni**.

1. **Bythoscopus variabilis** Fitch.

♀ *Athysanus do.*, Fitch, Homop. N. Y. State Cab. p. 60, 1851; Trans. N. Y. State Agric. Soc. xviii, p. 853, 1858; Rathvon, Mombert Hist. Lancaster County, Pa., p. 551; Packard, U. S. Ent. Com. Bulletin No. 7, p. 128 (after Fitch); Smith List of Ins. of N. J. p. 446, 1890.

*Bythoscopus do.*, Walk., List of Homop. iii, p. 876; Provancher, Petit Faun. Ent. du Can. p. 289, 1889 (erroneously written *variegatus*).

*Pediopsis do.*, Van Duzee, List Muskoka Hemip. Can. Ent. xxi, p. 9, 1889.

*Macropsis clitellarius* Provancher, Nat. Can. iv, p. 877, 1872 (= var. D).

♂ *Athysanus abietis* Fitch, Homop. N. Y. State Cab. p. 60, 1851; Trans. N. Y. State Agric. Soc. xvii, p. 748, 1857, and xviii, p. 854, 1858, Rathvon, Mombert Hist. Lancaster County, Pa., p. 551; Packard, U. S. Ent. Com. Bulletin, No. 7, pp. 129-235.

*Bythoscopus do.*, Walk., List of Homop. iv, p. 1162.

Head closely punctured. Vertex short, with a longitudinal central ridge; front more convex in the female than in the male, pronotum with fine, transverse rugae; anterior disc of the scutellum minutely punctured, apical field transversely striate; ultimate ventral segment of the ♀ long, produced posteriorly with a deep central notch. Length 5 mm.

Color: *Male*.—Piceous black; head yellow, apex of the front, a band on its base and another on the base of the vertex black, the two latter frequently confluent at their ends; hind edge of the pronotum and a band on the anterior submargin which may be extended over most of the disc as a suffused cloud, yellow. Legs yellow, outer face of the posterior and sometimes the anterior and intermediate tibiae blackish. Commissural nervure with a yellow spot; scutellum in pale examples with two diverging lines and the tip yellow. Beneath yellow, sometimes varied with black.

*Female*.—"Sulphur-yellow; elytra commonly with an oblique black vitta, then tips pellucid; vertex, thorax and scutel often fulvous or black" (Fitch). Tergum black, the segments edged with yellow.

Dr. Fitch notices six varieties, as follows:

- Var. A.—Dull yellowish white throughout.
- " B.—Bright sulphur-yellow throughout.
- " C.—An oblique black stripe on each elytron.
- " D.—Vertex, thorax and scutel tawny yellow.
- " E.—Vertex and thorax tawny yellow, scutel black.
- " F.—Vertex, thorax and scutel black.

To these I would add:

- Var. G.—Ferruginous brown, clavus pale yellow.

The oblique black stripe mentioned in var. C follows the clavial suture, and may be present in any of the other varieties, and is probably never absent in D, E, F and G, which thus show a regular gradation in the extent of dark markings they exhibit.

This species occurs on birch, but does not appear to be common, at least not around Buffalo. May to July, Lancaster, N. Y., var. C, E, and F; Ridgeway, Ont., var. C, one pair *in coitu* received from Mr. A. H. Kilman; Ottawa, Ont., one ♂ kindly given me by Mr. W. H. Harrington, has the scutellar and commissural margins of the clavus bright yellow; Quebec, L'Abbe Provancher var. A, C and D (= *Macropsis clitellarius* Prov.); Muskoka, Ont., July, 1888, var. A, C and G; New Haven, Ct., one ♂ swept from low bushes in a grove June 4, 1883. The pair kindly sent to me by my friend, Mr. Kilman, was of special interest, as proving the identity of this species and *abietis* Fitch.

2. **Bythoscopus sobrius** Walk. List Homop. Insects iii, p. 874, 1851.

Testaceous yellow above, pale straw color beneath, elytra deep fulvous brown, with a slight vinous tinge; vertex with an obsolete transverse yellow vitta. Length 5 mm.

Face rather convex, closely punctured; vertex with an impressed line above the ocelli and an obscure central ridge; base of the front with a faint yellowish line; cheeks, loræ, apex of the clypeus and all beneath pale straw yellow. Pronotum large, sloping quite strongly toward the head; finely transversely wrinkled and punctured, with a calloused area behind the eye. Elytra fulvous brown, commissural nervure obscurely alternated with pale. Wings very faintly smoky, nervures brown; ultimate ventral segment of the ♀ longer than the penultimate, apical margin rounded, notch small.

I am indebted to Mr. W. H. Harrington for a fine female example labeled "Ottawa, July 8th." Another ♀ taken by myself at Lancaster, N. Y., May 31, 1887, differs from this only in being more cinereous in color; in the presence of a black dot above the

ocelli, a dusky line on the base of the front and on the posterior margin of the dorsal segments of the abdomen, and in having the elytra of a deeper brown color.

This large, plainly colored species is most closely related to *variabilis*, to which it is allied by the form of its ultimate ventral segment, its convex face and sloping pronotum, otherwise it is quite distinct. Its rediscovery at Ottawa, by Mr. Harrington, is interesting as placing in its systematic position one more of Walker's numerous uncertain species.

3. ***Bythoscopus distinctus*** n. sp.

Pale yellow, or cinereous punctured with fuscous above, yellow beneath; elytra subhyaline maculated with brown ♀, or fuscous with a commissural and large costal spot hyaline ♂; apical areoles four, anti-apicals two. Length 3.5—4.5 mm.

*Male*.—Vertex, pronotum and scutellum punctured with fuscous. Pronotum more or less clouded within the posterior and lateral margins. Scutellum marked with a triangular spot within the basal angles, the transverse impressed line, two points before this and sometimes the median line black. Elytra fuscous, darker on the clavus and apex of the corium and marked with a whitish spot before the apex of the clavus and a larger costal spot on the anti-apical areoles, costal nervure yellow. Wings subhyaline, nervures fuscous. Beneath pale yellow, clouded with blackish on the pleural pieces; legs pale, spines of the tibiæ brown; tergum fuscous, segments edged with yellow. Genitalia whitish, pygofers embrowned.

*Female*.—Commonly paler than the male, with fewer fuscous punctures above; on the elytra the hyaline spots are more extended, or they may be entirely subhyaline with two brown spots on the commissural margin of the clavus and a shade on the apex of the corium.

In this species the vertex is short, the face, but feebly convex, the apex of the clypeus rather narrow, rounded, and the margins a little reflexed, and the head, pronotum and scutellum, are covered rather sparingly with large punctures. Last ventral segment of the female long, cylindrical, with a distinct, but *narrow* median groove, its apical margin feebly rounded and minutely notched on the middle.

Described from five male and nine female examples. Buffalo, one example swept from low bushes of *Populus grandidentata* July 10, 1889. Lancaster, N. Y., July and August. Niagara Falls, on oak M. C. Van Duzee. Maryland, June 11th, and Illinois, Uhler. Mt. Balsam, N. C., July, 1890, W. J. Palmer, Jr.

Although a very distinct species, the pale females bear some resemblance to *cognatus*, from which they may be distinguished by the number of elytral areoles and the narrow groove of the ultimate ventral segment.

4. **Bythoscopus cognatus** n. sp.

Cinereous or greenish brown, coarsely punctured, elytra subhyaline, alternated with brown and white along their suture; front blackish. Length 5 mm.

Vertex tinged with yellow; eyes and ocelli brown, front piceous or brown; clypeus paler, its rounded apex yellowish; loræ black, with a yellow discal spot; cheeks black, with a marginal yellow cloud below the eye. Pronotum paler on the anterior margin, disc transversely wrinkled and punctured; scutellum with the ordinary divergent pale lines and black discal dots, elytra cinereous, subhyaline, with a brown cloud from the base of the anti-apical areoles to tip of the clavus, sometimes extended to the apical margin, their suture pale, alternated with fuscous. Wings slightly obscured, nervures brown. Pectoral pieces piceous black, margined more or less broadly with yellow. Legs and venter brown; connexivum, and sometimes the margin of the ventral segment washed with yellow. Last ventral segment of the female a little longer than the preceding, apical angles rounded, disc with a broad, shallow, longitudinal depression, across which the apical margin is slightly concave, teeth minute, depressed. Plates of the male stout, covered with short hairs.

Described from two males and five female examples taken at Muskoka, Ont., July, 1888. A pale greenish white ♀ taken at Lancaster, N. Y., May 31, 1877; is probably immature. This large well marked form can be distinguished from our other maculated species by its size, uniform cinereous coloring and the form of the last ventral segment of the female.

5. **Bythoscopus fenestratus** Fitch.

*Athyas fenestratus* Fitch., Homop. N. Y. State Cab. p. 60, 1851; Trans. N. Y. State Agric. Soc. xviii p. 853, 1858; Rathvon, Mombert Hist. Lancaster, County, Pa., p. 551; Packard, U. S. Ent. Com. Bulletin No. 7, p. 128 (after Fitch); J. B. Smith, List Insects of N. J. p. 446, 1890.

*Bythoscopus do.*, Walker, List of Homop. iv, p. 1162; Provancher, Petite Faune Ent. du Can. iii, p. 289, 1890.

*Pediopsis do.*, Van Duzee, List Muskoka Hemip. Can. Ent. xxi, p. 9, 1889.

*Pediopsis flavescens* Provancher, Nat. Can. iv, p. 376, 1872; Petit Faune Ent. du Can. iii, p. 295, 1890.

Cinereous, or ferruginous brown, paler beneath; front usually discolored; elytra more or less deeply infuscated, fenestrated with whitish hyaline. Length about 4.5 mm.

*Female*.—Face finely punctured, ocelli connected by a pale yellowish band, above and below which is a darker shade; front dusky, sometimes almost piceous, with a smooth, paler area on either side; cheeks and sides of the clypeus pale; eyes and ocelli brown. Pronotum finely transversely wrinkled and punctured; scutellum sometimes more deeply colored than the pronotum, basal angles obscurely darker. Elytra grayish, fulvous, or even deep fuscous brown; scutellar margin of the clavus, a spot near its apex.

another on the apex of the discal areoles, and a larger one on the anti-apicals whitish hyaline. Wings subhyaline, nervures pale brown. Beneath yellow or fulvous, sometimes obscured on the venter and marked with black on the pectoral pieces, front of the femora and tibiae. Last ventral segment subtriangular, produced medially in two distinct, subacute teeth.

The male differs from the female only in being paler, at least on the front, and in having the elytra of an almost uniform fulvous brown tint with hardly a trace of the hyaline spots.

Buffalo, N. Y., June–August; Muskoka, Ont., July, 1888; Ridgeway, Ont., A. H. Kilman; Mt. Balsam, N. C., July 26, 1890, W. J. Palmer, Jr. Lives on birch. It is subject to considerable variation in the tint of its general color and the distinctness of the fenestrate markings of the elytra. From the preceding species it may be distinguished by the form of the last ventral segment of the female, from *pruni* by its clouded elytra, and from *minor* by its larger size, deeper color and the larger teeth of the last ventral segment.

6. **Bythoscopus pruni** Prov., Petite Faune Ent. du Can. iii, p. 290, 1890.

*Athysanus pruni* Fitch, MS.

Cinereous or grayish yellow, punctured with fuscous; corium hyaline, with the apex and a transverse spot fuscous; face yellowish; vertex banded with black. Length 4–4.5 mm.

Face yellow; front and apex of the clypeus blackish in the female; vertex black, with a broad yellow band connecting the ocelli; front and vertex coarsely punctured, the latter slightly tumid on the middle. Eyes brown, ocelli black. Pronotum yellowish cinereous, more or less obscured with fuscous punctures and commonly showing two or three black points on the calloused area behind the eye; surface with the transverse striæ and scattering punctures more obvious posteriorly; scutellum cinereous, yellowish, or sometimes ferruginous, marked as in *distinctus*. Elytra hyaline, more or less obscured, commissural nervure whitish, interrupted on its middle by a fuscous spot and with a smaller one at tip, nervures brown, apex of the corium clouded with brown, the transverse nervures fuscous margined. Wings obscurely smoky hyaline, nervures brown. Beneath yellow, pleural pieces marked with black; tergum blackish, the segments pale margined. Legs pale, spines of the hind tibiae and a line on their face at base brown. Genital characters as in *fenestratus*.

Described from ten males and four female specimens. Muskoka, Ont., July, 1888; Quebec, Provancher; Ottawa, Ont., Harrington; Saskatchewan, July 22d; White Mountains, "subalpine" Scudder; Massachusetts and Maine. The specimens from the four last mentioned localities were received from Mr. Uhler; that from the White Mountains bearing the label "*Athysanus pruni* Fh." M. Provancher's example came labeled "*Pediopsis cinctifrons*," which he afterward discarded for the one here employed.

This species is very closely related to *fenestratus*, of which it may prove to be the northern form. It can be best distinguished by the black transverse bands on the vertex, the hyaline elytra and the maculated scutellum. The similarity of genital characters would seem to indicate something less than a specific difference.

7. **Bythoscopus minor** Fitch.

*Athysanus minor* Fitch, Homop. N. Y. State Cab. p. 60, 1851; Trans. N. Y. State Agric. Soc. xviii, p. 583, 1858; Rathvon, Mombert Hist. Lancaster County, Pa., p. 551; Packard, Bulletin No. 7, U. S. Ent. Com. p. 128 (Fitch); J. B. Smith, List Insects of N. J., p. 446, 1890.

*Bythoscopus* do., Walker, List of Homop. iii, p. 876.

*Pediopsis* do., Van Duzee, List Muskoka Hemip. Can. Ent. xxi, p. 9, '89.

*Macropsis ocellatus* Prov., Nat. Can. iv, p. 377, 1872.

Pale yellowish, cinereous, or ferruginous brown; front dusky; elytra fenestrate with hyaline; last ventral segment of female short, with two small teeth on the hind margin. Length 4 mm.

*Female*.—Face coarsely punctured, leaving the smooth frontal areas quite strongly contrasted, ocelli brown, sometimes conspicuous in pale examples, apex of the clypeus narrowed and somewhat produced; front sometimes embrowned as in *nigrinasi*; disc of the cheeks and margins of the pectoral pieces and ventral segments paler, sometimes clear yellow; tergum, disc of the pronotum, scutellum and elytra commonly more deeply colored; the latter with a whitish spot next the scutellum, another on the discal areoles, a larger one on the anti-apicals, and a feeble indication on the apex of the clavus. In pale examples these spots are nearly obliterated. Wings whitish hyaline, nervures concolorous. Last ventral segment but little longer than the penultimate, hind margin but slightly produced medially, with a pair of short, rather distant teeth, including a shallow notch.

A single male from Maryland has the elytra fulvous brown with a slight vinous tinge and without hyaline spots, and the nervures of the wings brown, otherwise like the female.

Buffalo, N. Y.; Muskoka, Ont.; Quebec, Provancher; Maryland and Massachusetts, Uhler. There can, I think, be no doubt but that this is the insect described by Mr. Fitch as *Athysanus minor*, but I have not seen his types, if indeed they still exist, and his brief description will not admit of a positive identification. It is certainly very near *fenestratus*, of which it may be a pale variety.

8. **Bythoscopus nigrinasi** Fitch.

*Athysanus nigrinasi* Fitch, Homop. N. Y. State Cab. p. 61, 1851; J. B. Smith, List of Insects of N. J., p. 446, 1890.

*Bythoscopus* do., Walker, List of Homop. iv, p. 1162.

Color varying from pale yellowish cinereous to deep fuscous; legs yellow, front embrowned; elytra normally marked as in *fenestratus*; last ventral segment of the female bilobed on its apical margin. Length about 4 mm.

The color and the extent of the markings in this species is subject to great variation; ordinarily the front, inner margin of the cheeks, a part at least of the pectoral pieces, and a spot or ring near the apex of the femora are fuscous or black. Dark examples have the disc of the discal and anti-apical areoles, the base of the clavus and a spot before its apex whitish hyaline. In pale examples the elytra are subhyaline with two transverse fulvous or brown bands, more or less strongly indicated. Thus far the females. The males are of a uniform dark brown or fuscous shade, with the vertex, a transverse broad band on the front basally, and the the venter, soiled yellow; the legs pale yellow, and a space on the commissural nervure near its apex and sometimes another on its base whitish. In both sexes the face is less convex than in *fenestratus* and its allies and the vertex is consequently shorter; the pronotum is transversely rugosely punctured, the anterior margin slightly calloused and behind the eye obscurely pitted and the scutellum is frequently tinged with ferruginous. The last ventral segment of the female is rather short and bilobate, or waved on its hind margin.

This is our most abundant species in western New York. I have taken it in the vicinity of Buffalo, from June to August, and at "Rock City" near Salamanca, N. Y., Aug. 2, 1889, at an elevation of 1677 feet. Mr. Kilman has kindly sent me examples taken at Ridgeway, Ont., and I am indebted to Mr. W. J. Palmer, Jr., for several examples taken on Mt. Balsam, N. C. From Mr. Uhler I have received specimens labeled Grimsby (Ont. ?), Connecticut and Maryland, one of which is a typical example of *nigrinasi* received by Mr. Uhler direct from Dr. Fitch.

Although quite variable, this species can be readily distinguished by the form of the last ventral segment of the female, the blackish front, and usually by the markings on the elytra. It lives on the blue beech (*Carpinus americanus*).

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### ABSCHIEDSWORTE.

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With this notice, my editorial work on ENTOMOLOGICA AMERICANA ceases. The business affairs of the journal have been, and are such as to demand a constant personal attention, which I cannot give. I have therefore concluded to relieve myself of possible charges of neglect, and sometime since sent in my resignation to the Society in such terms as to leave them no alternative but acceptance.

It is with feelings of regret that I take leave of those to whom I have written so often, and I take this occasion to thank most heartily those who, by their aid and sympathy, have enabled me to attain such measure of success for the journal as has been its lot.

JOHN B. SMITH.

## Preparatory stages of *Schizura leptinoides* Grote.

BY HARRISON G. DYAR.

EGG.—Of the shape of the upper two-thirds of a sphere, flat below; minutely punctured, shining, very pale greenish yellow. Diameter 1 mm. Laid singly on the under surface of the leaf. Duration of this stage, seven days.

FIRST LARVAL STAGE.—Head depressed at the vertex, pale greenish yellow, the lower third shaded with sordid brownish. Width .5 mm. The body is slightly elevated dorsally at joints 5 and 12 and bears small warts, one per segment, row one anteriorly in subdorsal space, two subdorsal (these rows taken on each side form the "trapezoidal spots"), three more rows laterally and one on the bases of the legs, all small and bearing a few hairs. The warts of row one on joint 2 are rather larger than the others. Color yellowish green, joints 5 and 12 and the subventral space, except on joints 6 and 13 crimson; feet black, except the anal pair, and these are elevated. Length, after hatching, 2.5 mm. Duration of this stage three days. The larvæ eat the parenchyma and not the whole leaf, until the second stage.

SECOND LARVAL STAGE.—Head rather higher than wide, the lobes rounded, dark wine red, blackish on the flattened front. Width 8 mm. Body a little enlarged dorsally at joints 5 and 12, which, with the ventral and lateral regions, are dark brown. Dorsum brownish yellow, brighter on joints 3 and 4, and with a yellow patch of triangular shape on joints 10 and 11, ending abruptly on joint 11 posteriorly. Warts as before, small, with a few hairs. Length 5 mm. As the stage advances the whole body becomes dark reddish brown, finely mottled with yellow, especially so at the sides of joints 3 and 4 and dorsally on joints 6 and 7. On joint 10 is a small, bright yellow, oval patch, touching on joint 11 a larger, hemispherical, similarly colored spot, containing four partly confluent brown spots, its base toward the anal end, the contained spots in a transverse row of three, with the fourth in front. Duration of this stage four days.

THIRD LARVAL STAGE.—Head pale brownish, mottled with brown; a broad dark vertical band extends from each side of the mouth to the vertex of the lobe, once dentate inwardly above the middle; triangular plate and labrum pale. Width 1.3 mm. A dorsal process on joint 5 surmounted by two tubercles and slighter processes resembling humps on joints 8, 9 and 12. Besides the dorsal tubercles that surmount the humps, there are two lateral and

two subventral rows of smaller ones, while on joint 13 there are two tubercles in the dorsal rows. Body pale brown, heavily mottled with blackish brown, especially in a broad dorsal band on joints 2 and 4, and laterally on joints 5 and 10. On joints 3 and 4, laterally, is a subquadrate paler patch, yellowish above, and similar yellowish marks dorsally on joints 6 and 7. The yellow patch on joints 10 and 11 is as before. A whitish ventral band on the last segments. As the stage advances the lateral brown marks on joints 5-10 fade into the ground color, leaving a narrow, black, subdorsal line and all the yellow marks, except those on joints 10 and 11, disappear. Duration of this stage four days.

FOURTH LARVAL STAGE.—Head shaped as before, very pale brown, thickly and evenly mottled with little crinkled lines of dark brown; a few hairs. Width 2.1 mm. Dorsal process on joint 5 long, perpendicular in front, a little sloping behind, surmounted by two whitish tubercles each bearing a hair. On joint 8 is a slight elevation, on joint 9 a larger one, and a similar one on joint 12, a little larger than that on joint 8, each surmounted by two tubercles which, with those on the other segments, form row one of the first stage. The lateral ones are also present, small, whitish, each bearing a hair. Body pale brown, mottled with dark brown, evenly like the head, except that on joints 2 and 4 is a broad, dark brown dorsal band, while the sides of these joints are often paler; on joints 6 to 11 is a narrow subdorsal line, and on the dorsum of joints 6 to 8 are oblique brown lines, one on each segment, posteriorly to which the color is paler. The yellow patch on joints 10 and 11 (the usual V-mark) is triangular on joint 10, but on joint 11 is divided into three spots, the outer ones elongate, the posterior one small and rounded. Venter nearly black by the confluence of the mottlings; a broad, pale greenish, ventral band. Thoracic feet pale brownish testaceous; anal ones elevated when at rest. Duration of this stage four days.

FIFTH LARVAL STAGE.—Head higher than wide, slightly depressed at the vertex and marked as in the preceding stage. Maxillæ, bases of antennæ and ocelli, red-brown. Width 3.3 mm. The body for joints 2 to 4, 6, 11 and 13, is not as high as the vertex of the head; the dorsal process on joint 5 is long and large, its surmounting pair of tubercles pointing forward; joints 7 to 10 are arched and apparently enlarged dorsally by the abdominal feet being held close together, joints 8 and 9 each have a double hump, the one on joint 9 the larger, but both shorter than the process on joint 5; a slight double hump on joint 12, its apices closer together than

those of the others. The surmounting tubercles are brown, tipped with white, each bearing a hair. These tubercles form part of row one and the rest, arranged as the warts in *Arachnis picta*,\* are very small, whitish, and each bears a hair. The body is colored as in the previous stage, and is subject to considerable variation in the depth of coloration from very pale brown to almost black in different examples. The back of the head and a broad dorsal band on joints 2 to 4 are dark brown edged with whitish, and there is a narrow subdorsal line on joints 5 to 11 bordered below by a paler shade. The oblique dorsal lines on joints 6 to 8 are not distinct, but the pale shades bordering them are evident, and the angular mark on joints 10 and 11 has lost its bright yellow color and approaches very nearly these pale shades in appearance, or is slightly pinkish. Joints 12 and 13 are a little paler than the rest of the body and a pale shade passes up the back of the process on joint 5. There is a broad, pale whitish ventral band, with which the thoracic feet are concolorous; the abdominal feet are concolorous with the body, the anal ones but little used, and usually held against the leaf, or but little elevated. Spiracles pale brown, with a fine black border. A single dark colored larva out of the brood of thirty, from which this description is drawn, had a white spot above the spiracle on joint 11, and another smaller one before and below, in this character approaching the marking of *Ianassa lignicolor*. Length of larva about 30 mm. Duration of this, the last larval stage, six days.

**COCOON.**—Thin, rather tough, semi-transparent, parchment-like. It is spun between two leaves. The larvæ of the first brood pupate in a few days, but those of the second brood pass the Winter in the cocoon and pupate in the Spring. Only ten per cent. of my larvæ produced imago the same Summer.

**PUPA.**—Cylindrical, the abdominal segments gently tapering, capable of much motion. There is an elevation between the eyes bearing two small tubercles and a curved row of cubical granulations at the posterior edge of the thorax. Cremasters, two, parallel, separate, rather thick and bluntly spinose. Color shining dark red-brown. Wing cases creased and body punctured, but minutely.

**FOOD-PLANT.**—Hickory (*Carya*). Larvæ from Dutchess County, N. Y.

It will be observed that this larva differs from the larvæ of the other known species of *Schizura* in lacking the lateral green patch on the thoracic segments, and in the last stage the yellow dorsal V-shaped mark. In the last character it approaches the larva of

\* See ENTOMOLOGICA AMERICANA, vol. vi, p. 74.

*I. lignicolor* as well as in the curious occurrence of white spots at the spiracles of joint 11 as noted above. There does not seem to be any character to separate the larva of *I. lignicolor* generically from *Schizura*.

The larva of *S. leptinoides* is protected by its resemblance to a brown dead piece of Hickory leaf, and it has the habit of leaving pieces of leaf partly eaten off which soon wither and become brown, like the larva. It girdles the stem of the leaf that it is about to feed upon, causing it to bend down and be more easily reached. This habit is shared by *S. ipomeæ*.

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### NOTE ON LEPISMA DOMESTICA Pack.

By E. BERGROTH, Forssa, Finland.

In his synopsis of the North American Thysanura, Prof. Packard has described, under the specific name of *domestica*, a remarkable new *Lepisma* living in the houses about hearths and fire-places at Salem, Mass. From Packard's description there can be no doubt that this species is congeneric with the European *Lepisma furnorum* Prov., upon which Grassi (Bull. Soc. Ent. Ital. xix, 1887) founded the subgenus *Thermophila*, elevated to the rank of a genus by Oudemans (Tijdschr. v. Entomologie xxxii, 1889), who published a more complete description and an excellent colored drawing of the insect. *Thermophila* seems to be well distinguished from *Lepisma*, especially by the six-jointed maxillary palpi, but the name being twice pre-occupied in entomology (Lepidoptera and Coleoptera) I propose to substitute that of *Thermobia*.

*Thermobia furnorum* was detected in the Lombardy by Rovelli in 1884, and has lately been found abundantly in the bake-houses at Amsterdam by Oudemans. It lives in similar situations as the American *Th. domestica*, which, judging from the description, is nearly allied to, but specifically distinct from the European species.

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In accordance with custom, and for the last time in ENTOMOLOGICA AMERICANA, ye editor wishes all our readers and friends a Happy New Year.

J. B. S.

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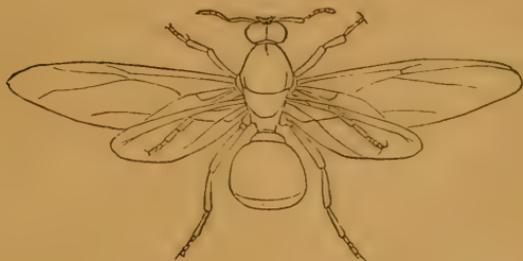


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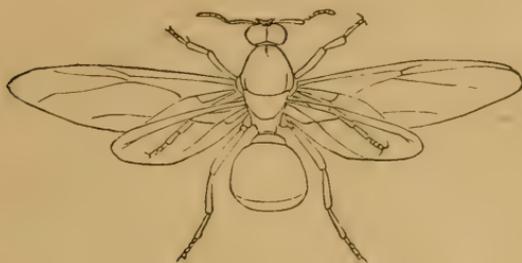
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FEBRUARY, 1890.

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## Brooklyn Entomological Society

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ASS'T EDITOR :

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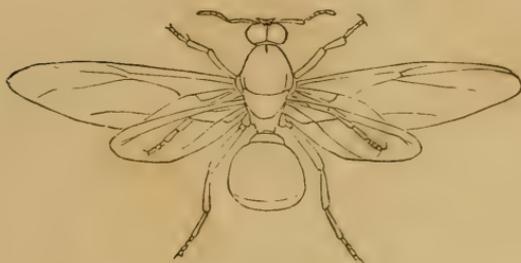
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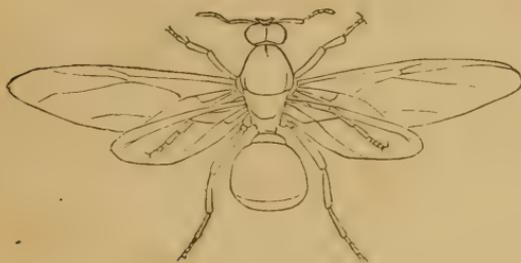
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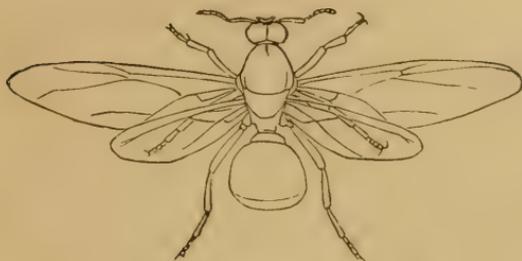
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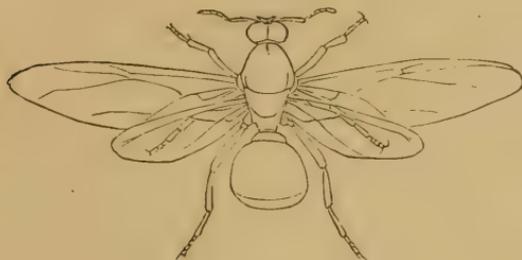
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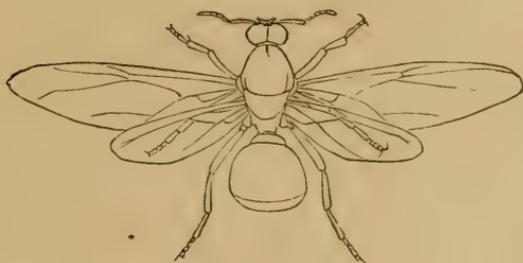
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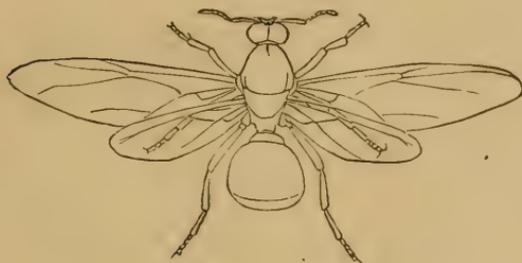
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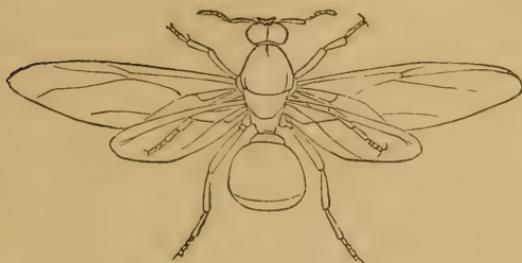
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ASS'T EDITOR :

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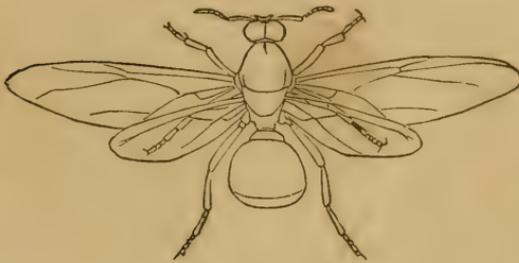
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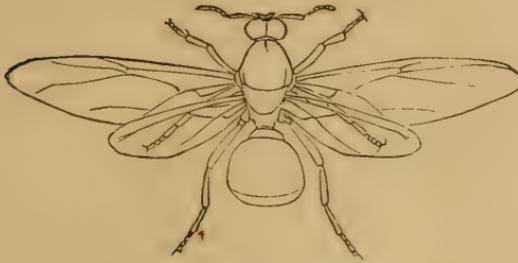
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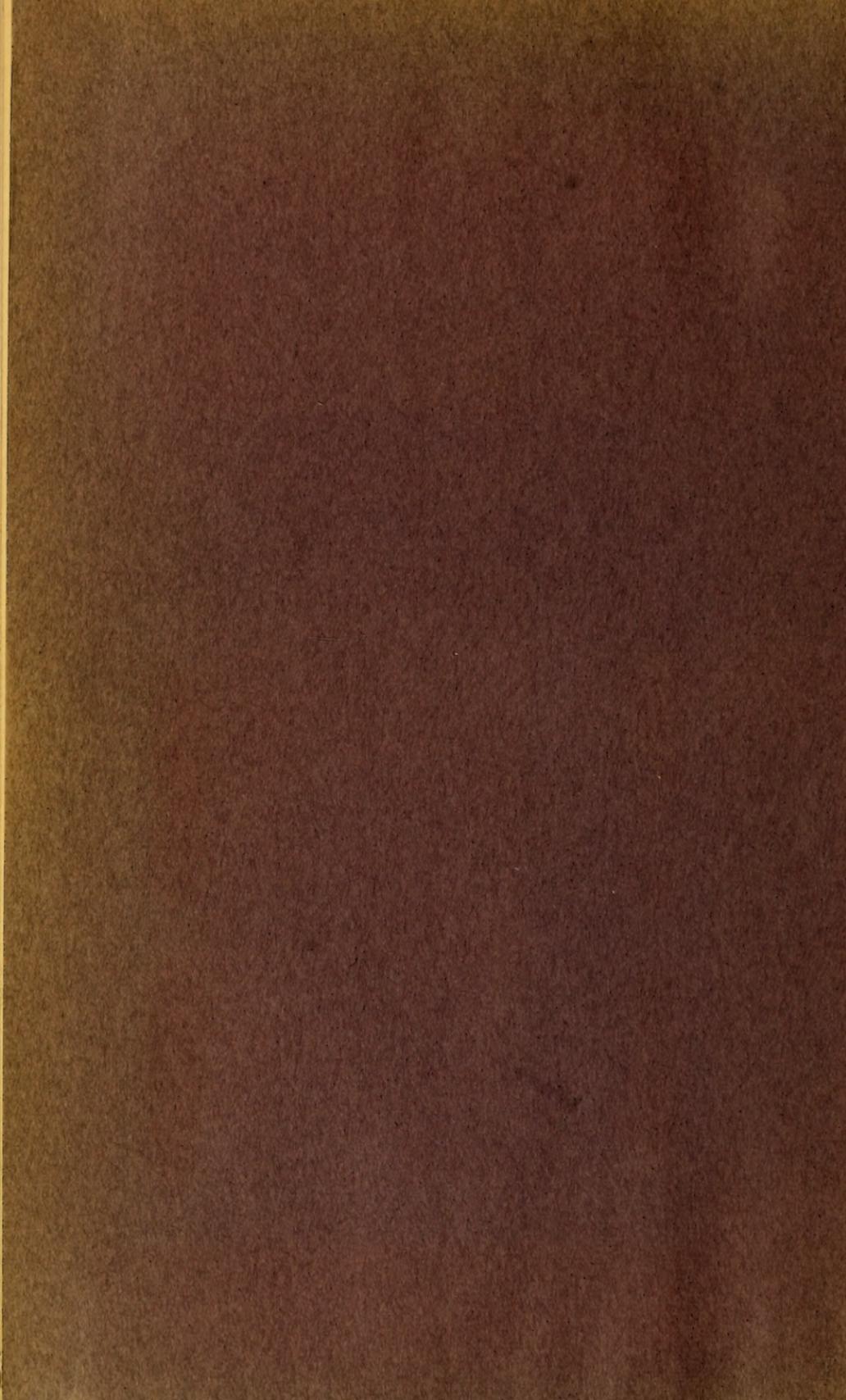
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